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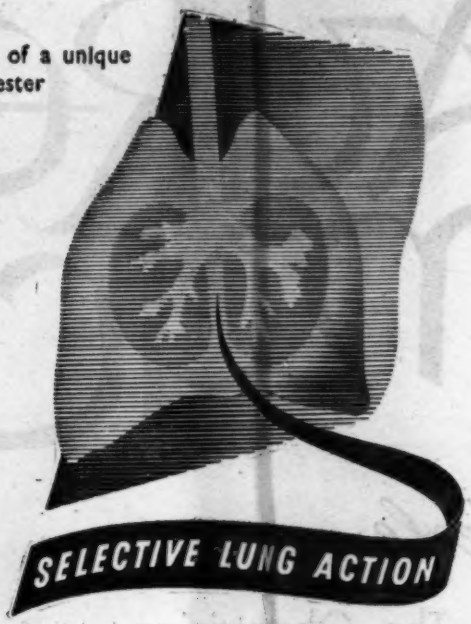

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*Knight, V.: Ann. N. Y. Acad. Sc. 53:332 (Sept. 15) 1950.

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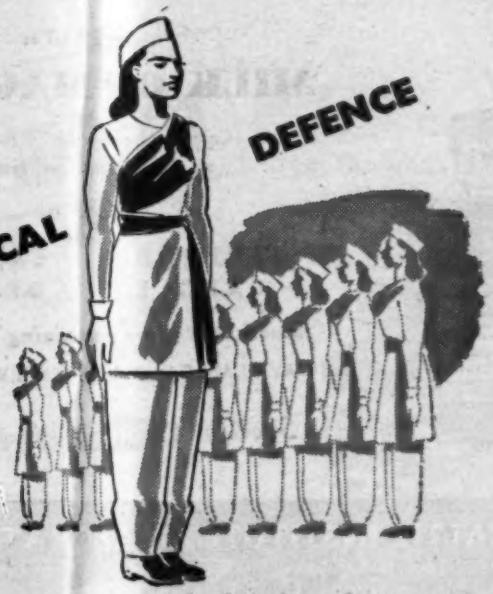

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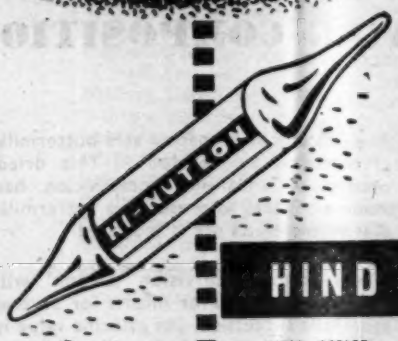

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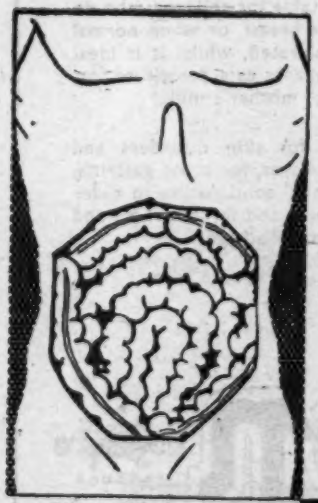

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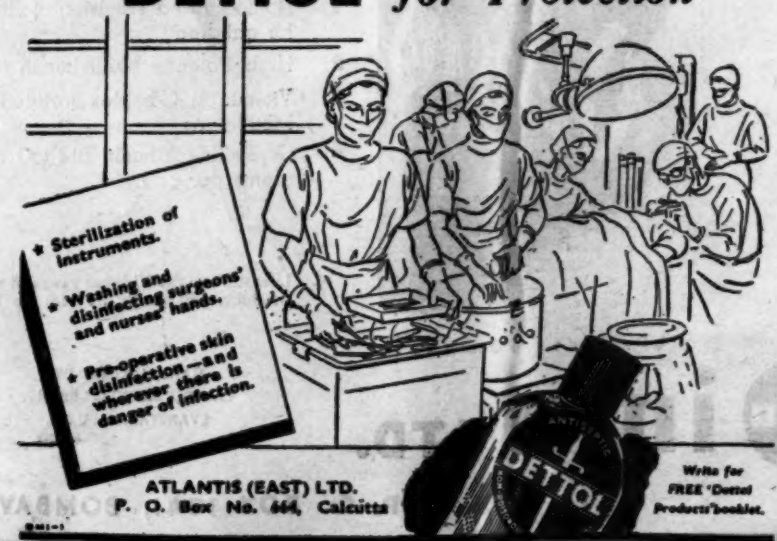
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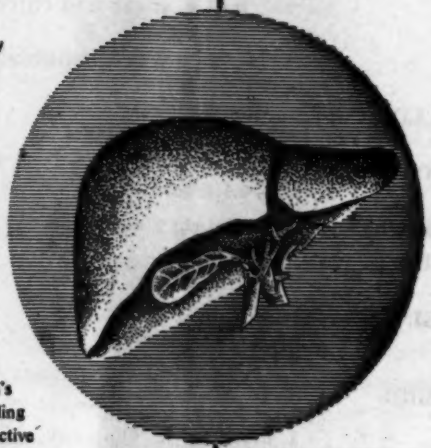

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CYTODIAGNOSIS OF NEOPLASMS

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Among the many recent advances in medicine, the development of the technique in the diagnosis of tumours by the cytologic method is of particular importance. It is universally realised that the most potent weapon against cancer is its early diagnosis. Malignant disease is common in all countries and ours is no exception though no reliable statistics are available at present. Any new method invented to make an early diagnosis of cancer is an important advance in the fight against the disease. Diagnosis of tumours by their cytology was known for a long time but it was put into wider practice after the development of the technique by Papanicolaou and Traut (1943).

Since the publication of the monograph by these workers, many modifications have been introduced with a view to perfect the technique and to improve the diagnostic accuracy. Among these the modification by Hunter (1947) in combining the technique with the tissue embedding method is of importance. This cytohistologic method as compared with the original cytologic method has since been used by many workers. Another useful modification by Gladstone (1949 and 1948) was the use of gel foam sponge in the collection and preparation of the material for biopsy. Of the other advances made along this line, the use of the phase difference microscope in the study of malignant cells by Firor and Gey (1947) and the use of ultraviolet light and fluorescent dyes in the detection of cancer cells by Friedman (1950) deserve mention.

The technique has also proved of use in making contact smears from the cut surface of biopsy specimens, especially lymph nodes, the frozen sections of which present great diagnostic difficulties. By using this method Hauptmann (1948) has studied in detail the characteristics of malignant cells as seen in smears.

Since the technique came into wider use, many reports analysing the results of examination in a large number of cases have appeared in the literature. The reports by Robertson (1948), Fremont Smith and Graham (1948), Gusberg and Graham (1950), Kraushaar *et al* (1949), Kaufmann and Fiege (1950), Isbell *et al* (1947) and Reicher *et al* (1950) may be mentioned. The general description and value of the technique have been described by Skapier (1949), Foot (1948) and others. A critical evaluation of the method is presented by Magner (1950) in his report prepared for the National Cancer Institute of Canada.

MATERIAL AND METHODS

The method has not come into wide use in India except in two or three places which have started using it. It was introduced as a diagnostic measure at the Christian Medical College Hospital in July 1949. The large amount of material available from the gynæcology, thoracic surgery and neurosurgery units of this hospital prompted us to try the method with a view to make it a useful and valuable adjunct to tissue diagnosis. 440 specimens from various sources were examined and this is a preliminary report of the work. Since the number of patients examined is small and the work was undertaken without any previous training, and experience was gained with the use of the technique during the last 18 months, a statistical evaluation of the method is not attempted herein.

The specimens were received from the outpatients and the inpatients departments of the Christian Medical College Hospital. An analysis of the material is presented in Table I. The 440 specimens were obtained from 406 patients and on an average two smears were examined for each case.

TABLE I—SHOWING ANALYSIS OF THE MATERIAL

Type of Specimen	*Negative*	*Suspicious*	*Positive*	*Total*
Cervical smears ..	116	33	84	233
Ascitic fluid ..	39	2	11	52
Pleural fluid ..	18	2	6	26
Sputum and Bronchial washings ..	42	6	4	52
Gastric contents ..	32	0	2	34
Urine sediment ..	10	3	1	14
Prostatic smears ..	0	0	2	2
Rectal smear ..	1	0	0	1
Brain smears ..	—	—	—	11
Miscellaneous ..	12	0	3	15
Total:	270	46	113	440

The smears for the diagnosis of uterine carcinoma could be prepared in different ways. The material from the vagina is aspirated by using a glass pipette, as originally described by Papanicolaou (*loc. cit.*). Various modifications have been introduced to improve the diagnostic accuracy of the method. Ayre (1944) introduced the aspiration of the mucus from the cervical canal. Endocervical and endometrial aspiration have been advocated by Papanicolaou and Marchetti (1943). Ayre (1947) later devised a wooden

spatula so designed (Fig. 1) to take smears directly from the circumference of the external os. More recently Hyams and Hyams (1950) have devised a new instrument which carries a slide on it and takes direct contact smears from the vaginal wall. We have been using the glass pipette for vaginal secretions and the wooden spatula for cervical smears. The latter is quite useful and has the advantage of giving specific cervical epithelial cells undiluted by the vaginal secretions. The gel foam technique of Gladstone (1948) has also been recommended by Rich *et al* (1950). We have not used endometrial aspiration. The material thus obtained is spread on plain glass slides or on slides covered with a thin layer of Meyer's egg albumin glycerine mixture. Thin smears are made and they are fixed while still wet in equal parts of 95 per cent alcohol and ether. Ayre and Dakin (1945) advocated fixing the aspirate in the mixture and treating the centrifuged deposit as tissue. The smears can be stained after fixing for at least an hour. They can be mailed to distant laboratories according to the technique described by Ayre and Dakin (1946). The smears were stained by the technique described by Papanicolaou (*loc. cit.*) using Harris hæmatoxylin, orange G 6 and EA 36.

Staining Procedure

1. After fixation, the slides are run down through 80 per cent, 70 per cent, and 50 per cent alcohols to distilled water.
2. Stain in Harris hæmatoxylin (prepared without acetic acid) for 6 minutes.
3. Rinse in distilled water.
4. Dip in 0·25 per cent aqueous solution of hydrochloric acid six times.
5. Place in running tap water for 6 minutes.
6. Rinse in distilled water followed by 50 per cent, 70 per cent, 80 per cent and 95 per cent alcohols.
7. Stain in OG 6 for 1½ minutes.
8. Rinse in two changes of 95 per cent alcohol.
9. Stain in EA 36 for 1½ minutes.
10. Rinse in two changes of 95 per cent alcohol, absolute alcohol, clear in xylol and mount in balsam.

OG 6 is made up as follows:—

Orange G 0·5 per cent solution in 95 per cent alcohol	..	10 cc.
Acid phosphotungstic	..	0·015 G.

EA 36 is prepared as follows:—

Light green SF (yellowish) 0·5 per cent solution in 95 per cent alcohol	..	45 cc.
Bismark brown	..	10 cc.
Eosin yellowish	..	45 cc.
Acid phosphotungstic	..	0·2 G
Lithium carbonate saturated aqueous solution	..	1 drop.

Other stains as EA 65, and EA 50, have been described by Pananicolaou. We have found that the stains, especially light green, prepared by the National Aniline and Chemical Company, New York, gave the best results.

Ascitic and pleural fluids are examined as soon as they are received. The centrifuged deposit is smeared on slides and fixed in alcohol-ether mixture. Different methods have been employed by different people. Hunter and Richardson (1947) advocated fixation in 10 per cent formalin and precipitation of the proteins with picric acid, the precipitate being treated as tissue. Gunnar Wihman (1948) collected the centrifuged sediment in a sausage skin bag and treated it as tissue. Kraushaar and Bradbury (1948) devised a new type of centrifuge tube with detachable bottom and the sediment was collected in a collodion bag which is then processed as tissue. Birge *et al* (1948) and Gold and Carrie (1950) have recommended the artificial clotting of the fluid with fibrin and thrombin and embedding the clot. The advantages and disadvantages for the smear and paraffin block techniques are discussed by Sattenspiel (1949). We have used the smear technique and Hunter's modification (1947). While the latter method has the advantage of presenting a concentrated cellular material and cells in the same focal plane it is time-consuming and causes cellular shrinkage. We have used the Papanicolaou stain for smears and hæmatoxylin and eosin for sections. Other workers have used Giemsa stain and Harris hæmatoxylin and eosin on smears (Saphir, 1949) and Papanicolaou stain on sections.

Sputum received for cytodiagnosis of carcinoma of lung should be fresh. Here again various methods have been advocated. Woolner and McDonald (1949b and 1947) advocate fixation in alcohol-ether mixture or Schaudin's solution and staining with Harris hæmatoxylin and eosin. Sambrook Gowar (1942-43) used Mayer's hæmalum and eosin for staining. Mathews (1948) recommended collection of the sputum in a gauze bag and fixing in Bouin's fluid and treating it as tissue. We have used the smear technique as a routine on fresh sputum or sputum collected in 70 per cent alcohol. In some cases embedding in paraffin after formol fixation was resorted to. Bronchial secretions were aspirated through the bronchoscope and sent to the laboratory in small capsules.

When the location of the tumour is necessary, material from both bronchi was aspirated separately and sent in separate containers. When the secretions are scanty the bronchi can be irrigated with sterile saline and the washings examined.

Smears were taken while the material was fresh and fixed in alcohol-ether mixture. Hunter's modification was employed in those cases where enough material was available. Smears were stained by the Papanicolaou technique while sections were stained with hæmatoxylin and eosin. Richardson *et al* (1949) recommend the use of hæmatoxylin eosin and orange G for sections. Diggs (1948) found Wright's stain quite satisfactory.

Material for the cytologic diagnosis of carcinoma of the stomach is obtained in various ways. We have examined only the aspirated material from the fasting stomach. Saline washings can be obtained for examination but Bryant *et al* (1949) feel that the procedure adds very little to the information obtainable from the fasting gastric residuum. Ulfelder *et al* (1948) have described a technique for obtaining saline washings from the stomach with a modified Levine tube left *in situ* for a period. More recently Panico *et al* (1950) have devised an inflatable abrasive balloon which when introduced into the stomach and inflated causes increased exfoliation of the cancer cells. The advantage of this method lies in the fresh exfoliation of cells, which show better morphologic detail than those encountered in the fasting juice. Gladstone (1949) advocates the use of the sponge in obtaining tissue from the stomach. The material obtained is examined by the Papanicolaou smear technique or by Hunter's paraffin embedding method. We have used these methods, but it has been found that the cellular details are poor in both. We have not tried the modified procedures of aspiration from the stomach. Richardson *et al* (1949) prefer the cytohistologic technique to the cytologic technique. They have also utilised this method in the diagnosis of non-malignant conditions of the stomach.

Examination of the urine sediment for cancer has been resorted to in the diagnosis of malignant disease of the kidney, bladder and prostate. We have only used a sample of freshly voided urine. Bunge and Kraushaar (1950) obtained their specimens by means of the ureteral catheters at the time of routine retrograde pyelography. This is useful in locating the tumour in one or other kidney. It is also advisable to obtain catheterised specimens in women to avoid contaminatjon with cells from the genital tract. The urine is centrifuged and smears are prepared from the sediment. These can be stained by the Papanicolaou technique. This has been found satisfactory provided the specimens are fresh and degeneration of the cells has not occurred. Daut and McDonald (1948) have recommended the staining of smears with Sudan IV, besides the Papanicolaou technique for differential diagnosis of carcinoma of the prostate and hypernephroma, from tumours at the neck of the bladder and epithelioma of renal pelvis.

Besides examination of urine, prostatic secretions can be used in the diagnosis of carcinoma of the prostate. The technique for obtaining secretions is described by Herbut (1949). The prostate is digitally massaged through the rectum, with special attention to the suspected portion. The seminal vesicles should be avoided as far as possible, since the presence of epithelial cells of the seminal vesicles tends to confuse the cytologic picture. The secretion is collected on a slide by milking the urethra and smears are made immediately and fixed in alcohol-ether mixture. They may be stained by the Papanicolaou technique.

Material from the rectum and colon may yield cytologic evidence of malignant growths in these situations. Rectal smears may be obtained by digital examination using a minimum amount of lubricant. Specimens from higher regions can be collected on cotton swabs during sigmoidoscopy after a cleansing saline enema. Ayre (1950) has described a technique by which cells could be obtained from a rectal growth. A glass pipette with a rubber bulb is introduced into the rectum, guided by an examining finger, and material can be aspirated from the surface of the growth and the pipette withdrawn, the tip being closed by the finger. This avoids contamination with fæcal matter. Material obtained by colonic irrigation after a cleansing enema is useful in growths situated higher up. Smears are made and stained according to the Papanicolaou technique. They may also be fixed in chilled acetone as advocated by Wissemann *et al* (1949).

The wealth of material encountered in the neurological unit of this hospital has prompted us to use the cytologic diagnostic procedure in the diagnosis of brain tumours. The technique described by Dorothy Russell (1947) was adopted and so far the investigations have been only on an experimental basis. The material is obtained by aspiration with needle during ventriculography. If necessary the material may be obtained through a small burr hole. The aspirated tissue is smeared on slides and fixed while still wet in Schaudin's solution, or 95 per cent alcohol. After at least two minutes fixation the slides are washed in 95 per cent alcohol folowed by distilled water. They are then stained with a 1 per cent aqueous solution of toluidine blue for 1-3 minutes, depending on the thickness of the smear. Then it is washed in distilled water followed by 95 per cent alcohol and absolute alcohol. It is cleared in xylol and mounted in balsam. These smears fade after sometime but can be restained. Mann's eosin methylene blue may be used but takes a longer time. Our material was obtained only at operation since the initial object of the investigation was to become familiar with the technique and cytology before the method could be adopted as a diagnostic procedure.

The miscellaneous group of material reported herein includes aspirated material from tumours, scrapings from ulcers, and smears from the cut surface of lymph nodes and tumours received for examination. These were fixed and stained by the Papanicolaou technique.

Results

The results of the investigation are analysed in Table I on the basis of the material. The results were classsified into 5 groups according to the classification adopted by Papanicolaou in reporting smears of all fluids.

Class I—Absence of abnormal or atypical cells.

Class II—Atypical cells present but without abnormal features.

Class III—Cells with abnormal features but not sufficiently pathognomonic.

Class IV—Fair number of conclusive cells and cell clusters.

Class V—Large number of conclusive cells and cell clusters.

Class I and II constitute a negative report, class III suspicious, and class IV and V positive.

TABLE II—SHOWING ANALYSIS BY CASES OF VAGINAL AND CERVICAL SMEARS

Cytology	*Proved by Biopsy*		*Proved Clinically*
	Positive	*Negative*	*Positive*
Negatve ..	0	31	2
Suspicious ..	3	5	1
Positive ..	24	6	12
Total:	27	42	15

TABLE III—SHOWING ANALYSIS BY CASES OF EFFUSIONS

Cytology	*Proved by Biopsy*		*Clinically Proved*	
	Positive	*Negative*	*Positive*	*Negative*
Ascitic fluid				
Negative ..	1	3	0	9
Suspicious	0	0	0	0
Positive	2	0	3	0
Pleural fluid				
Negative ..	0	0	0	6
Suspicious ..	0	0	1	1
Positive ..	4	0	0	0
Total ..	7	3	4	16

TABLE IV—SHOWING ANALYSIS BY CASES OF SPUTUM AND BRONCHIAL WASHINGS

Cytology	*Proved by Biopsy*		*Clinically Proved*	
	Positive	*Negative*	*Positive*	*Negative*
Negative ..	2	8	2	6
Suspicious ..	0	2	1	0
Positive ..	3	0	0	0
Total ..	5	10	3	6

TABLE V—SHOWING ANALYSIS BY CASES OF GASTRIC CONTENTS

Cytology	*Proved by Biopsy*		*Clinically Proved*	
	Positive	*Negative*	*Positive*	*Negative*
Negative ..	0	1	4	12
Suspicious ..	0	0	0	0
Positive ..	2	0	0	0
Total ..	2	1	4	12

The Tables II to V show an analysis by cases of cervical smears, effusions, sputum and bronchial washings and gastric contents examined and controlled by clinical or tissue diagnosis.

Of the 194 untreated cases examined for uterine carcinoma, only 69 were biopsied. Most of the cases had only one biopsy taken. No biopsy was made in 15 cases but these cases were clinically proved to be malignant. In the first group 27 were reported positive and 42 negative for malignancy by tissue examination. 24 of the positive cases were reported correctly by smear and 3 were reported as suspicious. No false negative reports were made. 31 of the negative cases were correctly diagnosed cytologically, 5 were reported as suspicious and 6 were falsely reported as malignant. Of the 5 cases who had suspicious reports, 3 were erosions of the cervix, 1 was clinically suspected as early carcinoma, and 1, was a case of post-menopausal bleeding. In all these cases only one biopsy was done. Of the 6 false positive reports 5 were reported as class IV and one as class V. Only one biopsy was done in these cases. 3 cases were clinically proved to be carcinoma of the cervix. In 2 no definite diagnosis was made and the cases were not followed up. One case was clinicaly suspected to be carcinoma of the cervix, but biopsy of the cervix showed tuberculosis. A review of the smear showed that there were cells which conform to the usual criteria of malignancy.

Of the 27 cases with positive smear reports, two were proved to be adenocarcinoma of the body of the uterus and in one case the smear report suggested the diagnosis.

In the 15 cases clinically proved to be malignant, 2 negative, 1 suspicious and 12 positive smear reports were made. Of the positive reports 1 was a case of carcinoma of the ovary.

30 cases were examined during or at the completion of radiation therapy. In this group 13 positive, 11 suspicious and 6 negative smear reports were made. Of the 11 suspicious reports one turned negative on subsequent examination at the end of treatment.

Of the 48 cases from whom ascitic fluid was sent for examination diagnosis was established in 6 cases by tissue examination and in 12 clinically. In the former group 3 had malignant disease. Of these 2 were correctly diagnosed by smear while 1 was wrongly diagnosed as negative. In the latter group all the 3 cases were correctly diagnosed as negative. Of the clinically proved cases 3 were correctly diagnosed by cytology as positive and 9 correctly diagnosed as negative.

Among the 22 cases in whom pleural fluid was examined, the diagnosis was checked by tissue examination in 4 and clinically in 8. In the former group all the 4 were malignant and were correctly diagnosed by cytology. In the latter 6 were correctly diagnosed as negative and 2 suspicious reports were given one on each of a malignant and non-malignant case.

Sputum and bronchial washings were examined in 40 cases of which 15 had tissue examination and 9 were clinically proved. In the former group 3 of 5 malignant cases were correctly diagnosed as positive and 2 as negative. One of these cases was a pleural endothelioma while the other was carcinoma of the œsophagus, where sputum examination was done to detect possible extension to the respiratory tract. 8 out of 10 non-malignant cases were correctly diagnosed while a suspicious report was returned in 2. Of the 9 clinically proved cases 6 were correctly diagnosed as negative and 2 as positive. One malignant case was given a suspicious smear report.

Of the 31 cases who had examination of gastric residuum, 3 cases had tissue examination while in 16 the diagnosis was considered obvious clinically. In all these the cytologic reports were correct.

FIG. 1

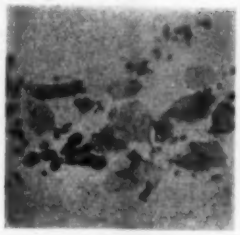

FIG. 2(a)

FIG. 2(b)

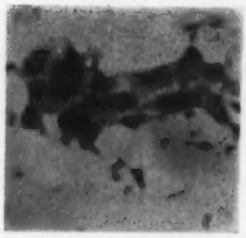

FIG. 3(a)

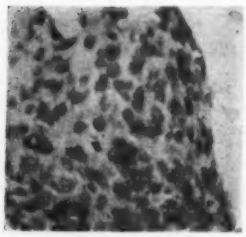

FIG. 3(b)

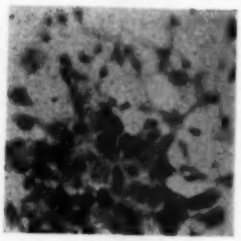

FIG. 4

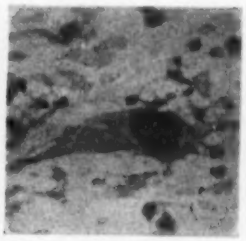

FIG. 5(a)

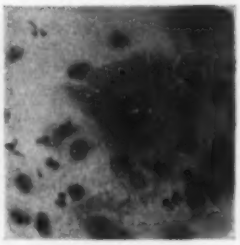

FIG. 5(b)

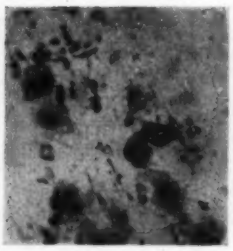

FIG. 6(a)

FIG. 6(b)

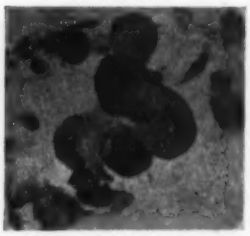

FIG. 7(a)

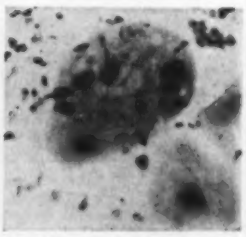

FIG. 7(b)

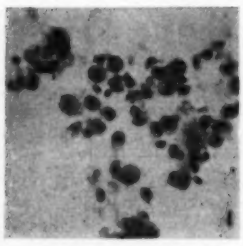

FIG. 8

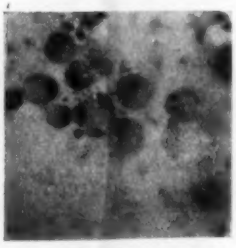

FIG. 9(a)

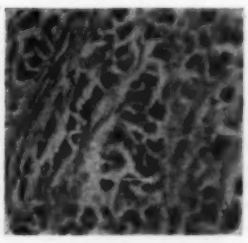

FIG. 9(b)

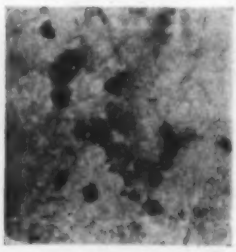

FIG. 10

Fig. 1—Equipment for taking vaginal and cervical smears.
Fig. 2—Normal vaginal smear showing (*a*) Squamous epithelial cells X 110 and (*b*) columnar epithelial cells X 230.
Fig. 3—(*a*) Cervical smear showing a clump of malignant cells X 230. (*b*) Section of the tumour from the same case showing epidermoid carcinoma X 230.
Fig. 4—Cervical smear showing a large group of malignant cells X 230.
Fig. 5—(*a*) & (*b*) Cervical smears showing giant malignant cells X 230.
Fig. 6—(*a*) Vaginal smear showing malignant cells X 230. (*b*) Endometrial curettings from the same case showing adenocarcinoma X 70.
Fig. 7—Effect of radiation (*a*) a clump of malignant cells with indistinct nuclei and nucleoli X 470. (*b*) a large multinucleated giant cell with vacuolated cytoplasm X 230.
Fig. 8—Malignant cells in ascitic fluid from a case of ovarian carcinoma X 230.
Fig. 9—(*a*) Malignant cells in pleural fluid X 230. (*b*) Section of the lung from the same case showing carcinoma X 230.
Fig. 10—Malignant cells in gastric residuum X 230.

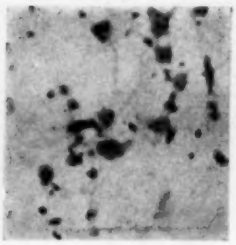

FIG. 11(a)

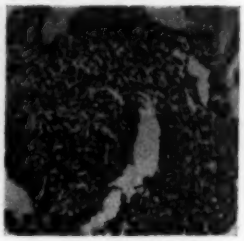

FIG. 11(b)

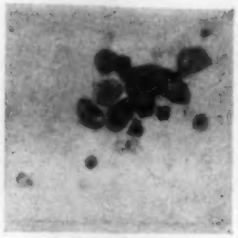

FIG. 12(a)

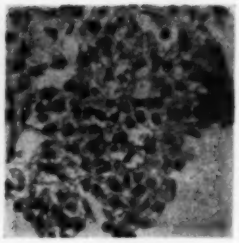

FIG. 12(b)

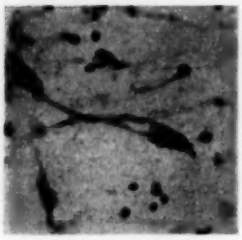

FIG. 13(a)

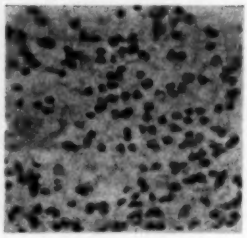

FIG. 13(b)

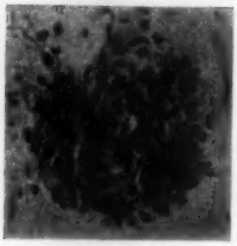

FIG. 14(a)

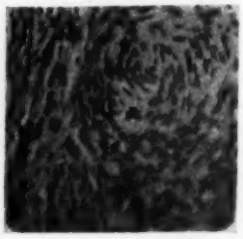

FIG. 14(b)

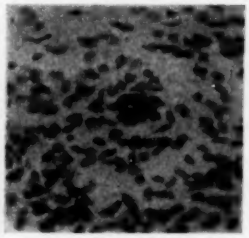

FIG. 15(a)

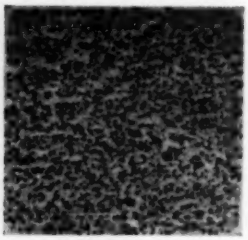

FIG. 15(b)

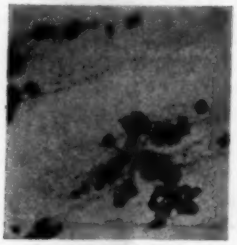

FIG. 16(a)

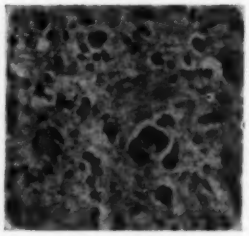

FIG. 16(b)

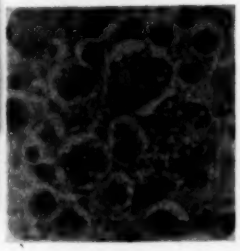

FIG. 17(a)

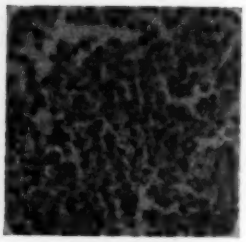

FIG. 17(b)

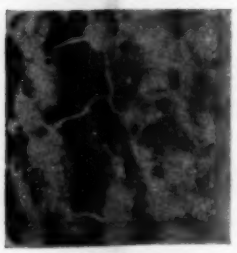

FIG. 18(a)

FIG. 18(b)

Fig. 11—(*a*) Malignant cells in bronchial washing X 230. (*b*) Bronchial biopsy from the same case showing carcinoma X 110
Fig. 12—(*a*) Malignant cells in prostatic smear X 230. (*b*) Biopsy of the prostate from the same case showing carcinoma X 230.
Fig. 13—Smear from (*a*) normal cerebral cortex showing Betz cell X 230 and (*b*) normal cerebellum showing small granule cells X 230.
Fig. 14—(*a*) Smear from meningioma X 230. (*b*) Section of the same tumour X 230.
Fig. 15—(*a*) Smear from medulloblastoma X 230. (*b*) Section of the tumour X 110.
Fig. 16—(*a*) Smear from glioblastoma showing cellular pleomorphism X 230. (*b*) Section of the tumour X 230.
Fig. 17—(*a*) Smear from pituitary adenoma X 470. (*b*) Section of the tumour X 230.
Fig. 18—(*a*) Smear from tuberculoma showing caseous material X 230. (*b*) Section of the same showing giant cell system X 110.

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Of the 14 cases in whom urine sediment was examined 6 had tissue examination and 5 of these had malignancy. 2 cases were wrongly diagnosed as negative, 2 were reported suspicious and 1 positive by cytology. Of the two negative reports one was a case of nephroblastoma and one was a malignant papilloma of the bladder with malignant change in the base of the tumour. Of the 2 cases returned suspicious, 1 was malignant papilloma of the bladder and 1 was carcinoma of the prostate.

Of the 2 cases of prostatic carcinoma diagnosed by smear one was proved by tissue examination and the other had secondaries in bones and tissue diagnosis was not attempted.

Only one rectal smear was examined from a non-malignant stricture of the rectum proved by biopsy.

Of the 11 brain smears examined, the tentative diagnosis was found to be correct by tissue examination in 8 cases.

Discussion

The cytodiagnosis of cancer is based upon the fact that both normal and cancer tissues shed cells continuously from their surfaces. Tlıis exfoliation occurs more easily in tumours than in normal tissue. Coman quoted by Graham and Meigs (1949) showed that the force required to separate normal cervical cells was ten times that required to separate cells of squamous carcinoma of the cervix. The study of the cytology of vaginal secretion is not only used in the diagnosis of carcinoma of the uterus but has also been used in the diagnosis of carcinoma of the ovary as well as vulvar carcinoma. Frech and Savannah (1949) describe an ovarian carcinoma diagnosed by vaginal smear and they consider that the cells are carried along the fallopian tubes or by direct extension into the vagina. Carter *et al* (1950) report 18 cases of vulvar carcinoma which were diagnosed by smear.

But the greatest use of the vaginal smear technique has been in the diagnosis of uterine carcinoma.

The criteria on which a diagnosis of malignancy is based have been described in detail by many workers. The normal vaginal smear shows erythrocytes, endometrial cells, superficial squamous cells with acidophilic cytoplasm, cells from the deeper layers of the epithelium, leucocytes, and histiocytes. The cells vary according to the stage of the menstrual cycle, and the sexual age of the individual.

The malignant cells have certain characteristics. The nucleus tends to be unusually large in proportion to the cytoplasm, and there are hyperchromatism and irregularities of the nucleus with prominent nucleoli. The cytoplasm of the cells may show different staining but it often tends to be basophilic. Mitoses are rarely found. The cells may appear in clusters. In cervical smears the malignant cells are more numerous than in the vaginal smears where the presence of vaginal cells tends to complicate the picture. Vacuolisation of the cells has no special significance. The presence of histiocytes in large numbers, in the absence of inflammation is suggestive of a malignant process, provided the smears have not been taken in the postmenstrual period or following coitus. McSweeney (1948) has described two types of cells as almost pathognomonic of carcinoma. One is a spindle cell shaped like a fibrocyte and the other a "tad-pole cell" with a cytoplasmic tail and irregular nucleus.

Aberrant basal cells are often met with in certain non-malignant lesions of the cervix. These present great diagnostic difficulties and are mainly responsible for the false positive and suspicious reports.

An analysis of the various figures of accuracy of the technique is presented by Wiles and Hellwig (1948) and by Gusberg and Graham (*loc. cit.*). Meigs *et al* (1945) analysing 1015 cases report a diagnostic error of 4 per cent. Scheffey *et al* (1948) report correlation in 94·8 per cent of 500 cases. The percentage of false positives and false negatives varies with different laboratories. Isbell *et al* (*loc. cit.*) had 1·17 per cent false positives in 1045 operated cases, Reicher *et al* (*loc. cit.*) 18·4 per cent total false positives in 3500 smears, Fremont Smith *et al* (*loc. cit.*) 1·3 per cent false positives in 5621 smears, Graham and Meigs (1949) 0·04 per cent false positive and Graham and McGraw (1950) 0·9 per cent false positives in 7,544 patients. The percentage of false negatives is about 10 per cent in cervical carcinoma while it is more in endometrial carcinoma. Fremont Smith *et al* (*loc. cit.*) had 26·5 per cent false negatives in endometrial carcinoma. Magner (*loc. cit.*) considers that 90 per cent of cervical carcinoma and 80 per cent of endometrial carcinoma can be diagnosed correctly. In some instances it is impossible to say whether the cancer is cervical or endometrial.

A negative smear indicates nothing. It does not exclude cancer but only means that the cells are not being desquamated. On the other hand false positive results are of significance. These result from wrongly identifying histiocytes and abnormal basal cells, as malignant. A high percentage of false positives is said to mean a condemnation of the technique and the laboratory which handles the specimens. But however much a laboratory may be efficient it is difficult to avoid a few false positives. Ayre and Ayre (1950) have found that staining the false positive smears for glycogen provides a valuable check. Malignant cells consistently lack glycogen. The aberrant basal cells which are often the source of error can be identified as non-malignant, if they contain glycogen.

More important than the diagnosis of invasive carcinoma of the cervix, is the finding of preinvasive cancer. Various people have used the method for this purpose and have described specific cytologic features for this type of carcinoma. Ayre (1949) mentions about the "precancer cell complex", which can be encountered by the surface biopsy technique. It is characterised by persistence of high number of

cornified cells, atypical cornified cells, cell gigantism, multilobulation of nuclei of the cells from all strata, hyperplastic basal cells and perinuclear halo. According to Nieburgs and Pund (1949) preinvasive cancer cells have certain characteristics. They have a greater amount of cytoplasm and stain orange yellow. The nuclei may be small, hyperchromatic without details or they may be large, foamy, and agranular. Bizarre forms and multinucleate giant cells are rarely found. The cells occur singly or in loose groups but never in adherent clusters.

The real value of the cytodiagnosis of carcinoma of the uterus lies in the early diagnosis of the disease. To attain this goal, many workers contend, one should search for the disease among apparently healthy women, by applying the test as a screening procedure. Skapier (1949) found 21 cases of preinvasive carcinoma in apparently healthy females. Pund *et al* (1947) diagnosed preinvasive carcinoma of the cervix by endocervical smears. Fremont Smith and Graham (*loc. cit.*) picked up two unsuspected cases of carcinoma from 200 unselected cases. Kaufmann and Fiege (*loc. cit.*) detected 29 proved cases and 10 suspicious cases among 1721 patients in office practice. Many workers have shown the value of the procedure while a few like Magner (*loc. cit.*) are skeptical about the results. Kraushaar *et al* (*loc. cit*), screening 5,314 women conclude that by coordinating cytologic, clinical, and histologic methods of detection, few genital malignancies will escape diagnosis. Novak (1949) considers that in the screening field, vaginal cytological methods offer definite advantages over biopsy, even if multiple biopsies are resorted to.

The vaginal cytology has also been studied in cases under radiation therapy. Graham (1947) has described certain changes in the cells as a result of irradiation. The changes appear on the 8th or 11th day and consist of an increase in the size of the cell, vacuolisation and hydropic degeneration of the cytoplasm and the presence of multinucleate giant cells. Usually no neucleoli are visible. The malignant cells disappear on an average by the 24th day after radiation has begun. No changes are noticed in cases which do not respond to treatment. Graham considers that in the irradiated cases the prognostic accuracy is 88 per cent. Maloney (1950) also considers that the vaginal smears have value in determining the radiosensitivity of a case. Radioresistant cases could be picked out early in the treatment and treated surgically. In our laboratory a study of the radiation changes in cells has been started recently and it is hoped that it will furnish useful data.

Cytological diagnosis of malignancy by examining effusions has not got the same significance as that by vaginal smear, but only serves to make a differential diagnosis. When malignant cells are found in effusions, the condition is too advanced for any surgical intervention, unless done as a palliative measure. It can thus also be used to determine the inoperability of a case. Detection of cancer cells is fairly easy in effusions. Honigman (1945) found malignant cells in 60 per cent of fluids from cases of confirmed carcinoma. Exudates occurring in malignant cases contain numerous mesothelial cells, red blood cells, leucocytes, lymphocytes and tumour cells. The latter are large in size, have large irregular nuclei, the cytoplasm is larger in amount than in the mesothelial cells, show large nucleoli and atypical mitoses. Tumour cells may sometimes appear in clumps when it may be possible to identify the histological nature of the tumour. Gunnar Wihman (*loc. cit.*) has used the method in the diagnosis of non-malignant conditions also.

Cytodiagnosis has proved to be of considerable value in the diagnosis of carcinoma of the lung. As early as 1860 Beale quoted by Ross (1950) observed multinucleated cells in sputum from an advanced case of carcinoma of the pharynx. Hamplen quoted by Ross (*loc. cit.*) first demonstrated in 1887 tumour cells in sputum from a case of lung cancer. Dudgeon and Wrigley, quoted by Woolner and McDonald (1949a) were the first to demonstrate the practical value of this method. Herbut and Clerf (1946) have described three types of cancer cells; clusters of cells occurring in squamous cells carcinoma, large irregular single cells from more dedifferentiated tumours and smaller uniform cells from oat-cell carcinoma. Farber *et al* (1948) have described the general criteria of malignancy, which include variation in size, shape and density of the nuclei, crowding of the cells, large nucleus with scanty cytoplasm and prominent often multiple nucleoli. They have also been described by Woolner and McDonald (1949c) and by Richardson *et al* (*loc. cit.*). The accuracy of the method has been studied by various people and figures differ. Farber *et al* (1950) report an accuracy of 55 per cent in their series of 2,066 cases. They conclude that small cell undifferentiated carcinomas are detected only half as frequently as differentiated epidermoid and adenocarcinomas. Woolner and McDonald (1947 and 1949c) report 80 per cent accuracy. In one of their series these workers (1949a) have reported correct diagnosis in 6 cases of Pancoast tumour and 4 cases of alveolar cell carcinoma. Herbut and Clerf (*loc. cit.*) in a series of 30 cases found that 22 cases were detected by cytologic technique while only 11 were detected by biopsy from the same series. Magner (*loc. cit.*) has concluded that over 70 per cent of lung carcinoma can be correctly diagnosed. Bergmann *et al* (1948) consider the technique to be of value in the differential diagnosis of apical pulmonary lesions. The method can also be of use in the diagnosis of carcinoma of the œsophagus with extension to the respiratory tract.

Cytologic diagnosis of gastric cancer presents great difficulties since the exfoliated cells undergo degeneration rapidly and the cellular details become indistinct. The malignant cells often appear in groups, show hyperchromatic nuclei and prominent nucleoli. The nuclear cytoplasmic ratio is disturbed and the cytoplasm often shows vacuolisation. The figures of accuracy vary with different reports but they are comparatively low when compared with those for carcinoma in other situations. Fremont Smith *et al* (*loc. cit.*) correctly diagnosed 54 per cent and reported 2·3 per

cent false positives. Bryant *et al* (*loc. cit.*) report 48·6 per cent accuracy. Graham *et al* (1948) were able to detect resectable lesions of the stomach by this method. One of our cases detected by smear was resectable.

Urine sediment can afford valuable information in the diagnosis of carcinoma of the urinary tract. When the tumour is in contact with urine, cells can be usually detected in urine sediment. The cells have large irregular nuclei with prominent clumped chromatin and multiple nucleoli. The nuclear cytoplasmic ratio is reduced. The percentage of accuracy has been worked out by various authors. Chute and Williams (1948) correctly diagnosed 55 per cent of malignant tumours and had 12 per cent false positives. Fremont Smith *et al* (*loc. cit.*) correctly diagnosed 71 per cent of bladder carcinoma, 50 per cent of kidney carcinoma and 42 per cent of prostatic carcinoma. Magner (*loc. cit.*) is of the opinion that 60 per cent of carcinoma of the urinary tract can be correctly diagnosed. Schmidlapp and Marshall (1948) believe the method to be of greatest value in the diagnosis of bladder carcinoma.

Carcinoma of the prostate can also be diagnosed by examination of the prostatic secretions. Herbut (*loc. cit.*) has described in detail the malignant cells from prostate. They often appear in large irregular sheets with bluish green to light brown or very light orange staining large cells. The cell margins are indistinct and the nuclei may be multiple, round or oval or irregular with well defined borders. The chromatin is evenly distributed or in occasional clumps and one or more distinct nucleoli are visible. The diagnostic accuracy depends on the mode of obtaining the specimen and avoidance of seminal vesicle epithelium. Boyer (1950) concludes that because of the high false negatives the cytologic technique is not superior to the other diagnostic procedures.

The accuracy of the cytodiagnosis of malignancies of the colon and rectum is presented by Wisseman *et al* (*loc. cit.*). They consider that the percentage of accuracy is 76 while sigmoidoscopy and x-ray examinations provide a diagnostic accuracy of 67 per cent and 79 per cent respectively. But this procedure offers only a method of quick confirmation of a tumour and the value of it in the diagnosis of early carcinoma of the rectum and colon is questionable.

The wet film technique in neurosurgery, if properly used can prove to be a valuable method of diagnosis. One has to become familiar with the appearance of smears of normal brain tissue before diagnosis of tumours can be undertaken. The appearances of the various tumours on smear have been described by Dorothy Russell (*loc. cit.*). The tumours in which our tentative diagnosis on smears proved to be correct include meningioma, medulloblastoma, oligodendroglioma, glioblastoma multiforme, and pituitary adenoma. The meningioma is difficult to be smeared except in the softer varieties of tumours. The cells have distinct borders and are polygonal or spindle shaped. Occasional whorls or psammoma bodies can be identified. Another characteristic feature is the presence of vacuolar spaces in the nuclei. Medulloblastomas are easily smeared. The cells are small, spheroidal and show scanty indefinite cytoplasm. The nuclei are deeply stained and mitotic figures and multinucleate cells may occur. Oligodendroglioma is also easily filmed. The cells when they are in the "phase of acute swelling" show a clear space around the nuclei, which are spheroidal. Mitoses may occur. In the undegenerated tumour the cells appear in small clumps and show scanty processes. Glioblastoma also presents material that is easily smeared and easily diagnosed, the characteristic feature being variation in size and shape of the cells. Multinucleate cells may occur. Pituitary adenoma rarely needs a smear diagnosis. The cells show considerable variation in size and have well defined borders. The nuclei are often eccentric with one or two conspicuous nucleoli. Other tumours that can be diagnosed by this method include astrocytoma, secondary carcinoma, choroidal papilloma and ependymoma. Dorothy Russell has also used the technique for diagnosing various non-malignant conditions of the brain. Two of our cases were space occupying benign lesions and were diagnosed correctly. One was an abscess and the smear showed polymorphonuclear leucocytes and compound granular corpuscles. One was a tuberculoma in which the smear showed caseous material. No foreign body giant cells were seen.

The method can fall into disrepute, if used in a haphazard way. The technique and interpretation need special training. Gates and Warren (1945) suggest that a pathologist can acquire knowledge of the technique with a shorter training than others and according to Isbell *et al* (*loc. cit.*) it is possible to develop a vaginal smear laboratory in a pathology department within one year. Meigs (1947) is of opinion that the method is not an office procedure and should be interpreted only by those trained in cytology. The method is not only difficult to interpret but also time consuming. All portions of the smear should be thoroughly examined before a negative report can be given. Skapier (1949b) estimates that the rate of examination of slides is about 4-6 per hour, while Hamilton and Klotz (1948) place the time required for each smear as anything from 15 minutes to two hours. Because of this time consuming nature, Kaufmann and Fiege (*loc. cit.*) emphasise the necessity to shift the responsibilities for screening from professional to technical personnel.

The method if intelligently used can become a useful adjunct to tissue diagnosis. There are certain golden rules to be observed in using this technique. The smear method should never form the basis of undertaking any therapeutic measure. The diagnosis should always be confirmed by tissue examination, repeatedly if necessary. The original authors of the technique never intended the measure to be superior to or replace tissue examination and other methods of diagnosis. While tissue diagnosis may fail to find carcinoma, smear may detect it. This is not surprising since the piece of tissue selected by the surgeon need not be a representative one. In the case of carcinoma of the cervix the recently introduced cone biopsy tech-

nique may be of help in the better assessment of the value of the smear diagnosis in preinvasive carcinoma.

Conclusion

Thus it will be seen that the cytologic diagnosis of cancer is a very valuable method in detecting carcinoma in various situations. The method has both advantages and disadvantages. Among the advantages may be mentioned the simplicity of obtaining specimens, the relative rapidity of the technique, the possibility of repetition, the complementary nature of the method to other diagnostic procedures and the possibility of diagnosing in early stages of carcinoma. These particularly apply to the diagnosis of uterine carcinoma. It can also be used as a screening test, where a large number of tissue examinations is not possible. The disadvantages are that specialised training is required to make an accurate diagnosis, and the test often fails to indicate the type, grade and mitotic activity of the tumour.

In spite of the disadvantages, the method has too much value to be disregarded. While a number of malignancies remain undiagnosed even after tissue examination, there is no reason why the significance of errors in the smear technique should be magnified and statistics quoted to discredit the method. A statistical study of the technique often fails to represent its true value. The important point to remember is whether the method will lead to the early detection of cancer and the institution of treatment. Any method which serves this purpose of early diagnosis of malignant disease should be included in the diagnostic armamentarium of the medical profession. If the golden rule of not basing treatment on smear report is strictly adhered to the method can be of great use. When the difficulties in the interpretation are studied, it is obvious that every practitioner cannot become a cytologist. But one need not undergo specialisation in the preparation of smears. Once he has been shown the technique any practitioner can make smears. He need not stain and read these slides but can send them to the cytologists. Hence the procedure of choice is to have central laboratories in each state or if possible each district, staffed by trained personnel, who can stain and read the smears sent by the practising physicians.

Summary

1. The results of cytologic examination of 440 specimens from various sources are presented.

2. No statistical evaluation of the technique is attempted since the number of cases examined is small and tissue examinations have not been adequate.

3. A review of the relevant literature is made, dealing with the development, the technique, the advantages and disadvantages of the method. The difficulties and pitfalls that may be encountered are presented.

4. A plea is made to make a wider use of this method in the diagnosis of carcinoma in India.

Acknowledgment

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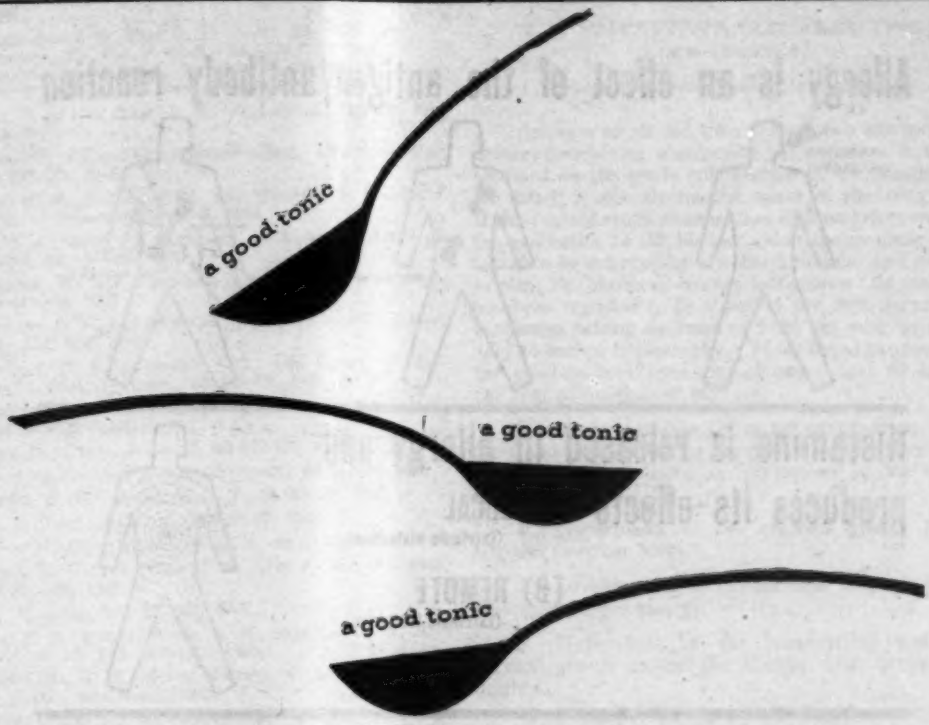

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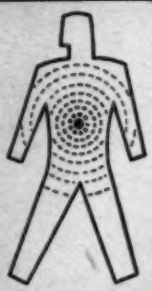
Histamine is released in allergy and produces its effects (A) LOCAL (Intrinsic histamine) (B) REMOTE (Extrinsic histamine)



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SURGERY OF THE PROSTATE

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As soon as an old man comes with symptoms of urinary trouble or obstruction the attention is always focussed on the senile enlargement of the prostate but the latter is not always the cause of the symptoms; If the routine rectal examination is done before or after the evacuation of the bladder either the prostate is not found to be enlarged or it is hard, nodular and massive in size; the hardness denotes malignancy; its incidence has been reported to be about 14 per cent, as primary carcinoma arising *de novo* or 2·26 per cent, as secondary to benign hypertrophy. Moor found carcinoma of the prostate in 17 per cent of males over 40 and 29 per cent of males over 80.

When the prostate on rectal examination is not hard and nodular but is normal or small the cause of the prostatic syndrome or prostatism is one of the following:—

1. Hyperplasia of the mucosal glands of the trigone (median bar).

2. Development of middle lobe only projecting into the bladder cavity.

3. Hyperplasia of the paraurethral and subcervical glands around the bladder neck or prostatic urethra.

4. Prostatic fibrosis—small fibrotic prostate.

5. Fibrous contracture of the bladder neck or formation of a fibrous median bar.

ETIOLOGY

The cause of the senile enlargement has been ascribed to be senile involution like chronic mastitis in the female and this is the most probable cause of the adenomatous and hyperplastic appearance of the gland. It is a sort of male climacteric described by Kenneth Walker with hormonal imbalance and metabolic disturbance. Enlargement of the prostate is related to senile changes in the testes and castration gives rise to atrophy of prostate. Lacassagne has found that œstrin injection causes hypertrophy of the posterior lobe of the prostate. The posterior lobe of primates on whom the experiments have been made is a modified utricle and differs from that in man and the response is a diffuse hyperplasia and not a nodular one as occurs in human beings.

Huggins has shown that the prostatic fluid consists of prostatic secretion and seminal fluid. The constituents of the former are: citric acid, calcium, acid phosphatase and fibrinolysin. The seminal fluid consists of fructose 0·5 per cent, phosphoryl choline. The acid phosphatase splits the bye products of the seminal fluid. The prostatic fluid of dogs is stimulated by androgens and lessened by œstrogens, the

former gives rise to hyperplasia, a metaplasia of the prostate and the latter brings it to normal. Kertshner and Wolberg isolated the phosphatase from a normal prostate which acts in an acid medium. There is no acid phosphatase in infant prostate but it increases in puberty and is present in the adult in normal, hypertrophied or malignant prostates. Normally large quantities of acid phosphatase is excreted and this acid phosphatase does not spread beyond the capsule of the gland. The patients with cancer of the prostate which is confined within its capsule has normal acid and alkaline serum phosphatase. In cases of advanced carcinoma of the prostate with bone secondaries, the acid and alkaline phosphatase level of the blood rises in 73 per cent of cases. Fergusson and Pagel reported the presence of acid phosphatase in glandular metastasis from prostatic cancer.

It has been observed by Huggins that after orchidectomy or injections of ethyl carbamate or urethane there is a fall of acid phosphatase. It has been reported that when bony metastases are present due to antiandrogen therapy by castration, the acid phosphatase level of blood falls but the alkaline phosphatase rises due to a nonspecific healing reaction. When relapse occurs the alkaline phosphatase slowly falls and the acid phosphatase rises again.

Pathology

In senile enlargement the part of posterior urethra above the verumontanum is elongated by the enlargement of the lateral lobes and the lower prostatic urethra is not affected. The posterior lobe is not affected at all in simple hypertrophy but always in carcinoma which arises there. Middle lobe enlargement may be associated with those of the lateral lobes or may exist alone projecting inside the bladder behind the internal meatus. Median bar may be fibroadenomatous or muscular. In the former the glands of Albarran some of which are subtrigonal above the sphincter and some subcervical "glands of Jores" below the sphincter are enlarged. There is a distinct elevated ridge formed in the interureteric region behind which the residual urine collects. The muscular form of median bar is due to hypertrophy of the detrusor muscle of Bell which lies between the ureteric orifices and the internal sphincter which occurs in association with the enlargement of the prostate.

Prostatic fibrosis is due to round celled infiltration and fibrosis in the prostate with atrophy of glandular tissue. The fibrosis occurs also in the bladder neck and the subtrigonal area causing contracture of the vesical neck and sometimes fibrotic median bar. There may be a preceding gonorrheal infection as the cause. The prostatic urethra is narrowed and the detrusor muscle of the bladder is normally atonic. The fibrosis spreads to the capsule and sheath, and complete operative enucleation is impossible.

Carcinoma of Prostate

In primary cancer the disease starts in the posterior lobe, while the one secondary to simple hyperplasia arises (1) on the surface of the hyperplastic tissue beneath the bladder mucosa, (2) in the centre of the adenomatous area, (3) on the outer surface of the lateral lobe in the false capsule of the gland whose lateral lobes are enlarged.

Carcinoma may spread directly to the urethra, bladder, seminal vesicles, rectum and pelvic organs may be infiltrated and fused—prostatic pelvic carcinomatosis of Guyon. Lymphatic spread occurs into (1) the glands lying on the levator and extending from the apex of the prostate outwards, (2) internal iliac glands, (3) inguinal glands—by retrograde spread (4) by permeation along the vas deferens.

The metastasis in the bones occurs in spine, pelvis, upper femur, ribs, scapula, upper end of humerus and skull. There is new bone formation in the metastatic deposits. The cancer cells are said to reach the pelvis through the perineural lymphatics and also through the blood stream. It occurs first in the pelvis because of the high reticuloendothelial content of the bone marrow. Roberts found definite evidence of lymphatic spread diminishing in amount up to the neck and suggested that permeation occurred from the sacral lymph glands through sacral foramina, the lymphatic space of the ligamenta subflava to reach the bodies of the vertebræ —the normal routes being previously obstructed. Norgore has described a paradoxical type of metastasis. The vertebral system of veins is without valves containing blood at low pressure and with a stream which is liable to have a flow in the reverse direction when there is change of posture, sneezing or coughing, the cancerous emboli flowing upwards in the vertebral veins might be directed by this reversal of flow into the skeletal tributaries to lodge in the bones. The skin is also the seat of metastasis in some cases and the cells reach there by blood stream.

Diagnosis

Diagnosis is made by the symptoms of dysuria or retention of urine occurring in old age. It is always better to do the rectal examination when the bladder is empty or has been evacuated; then a clear idea of the consistency and outline of the prostate is obtained.

During rectal examination the main points to note are: the size, consistency, surface and outline (upper and lateral borders) of the prostate. The median groove is palpated and the fixity of the prostate is determined. The surrounding area of the pelvis also is palpated for any hardness, thickening or glandular enlargement. The seminal vesicles are palpated, and sometimes a stone is felt in the bladder, when it is big, and may be the chief cause of symptoms. In the latter case prostate is normal in size and also when the cause of symptoms is middle lobe, median bar or fibrosis of the prostate. In 2 or 3 cases a diverticula has been found at the base of the bladder as the cause of urinary symptoms with the prostate normal in size, or the seat of chronic inflammation. In one case the diverticula was of the size of a tennis ball and in the other two

cases of one inch diameter. The latter were secondary to stricture of urethra.

Cystoscopic examination should always be made except when the diagnosis of senile hypertrophy or carcinoma is evident by rectal examination. It clarifies the diagnosis of middle lobe, median bar or diverticula or any abnormal condition of the bladder cavity.

The general condition of the patient is very important, so also a thorough examination of all the systems. The condition of the heart may be confirmed by electrocardiogram and those of the arteries and kidneys by blood pressure and kidney function tests.

The tests which are done are:—

1. Blood nonprotein nitrogen and blood urea.

2. Urea concentration tests (normal 2·5 per cent).

3. Urea clearance test—70 to 80 per cent of the normal may be taken as good.

4. Phenolsulphonphathalein test—operation may be performed when at least 20—30 per cent or more of the injected dye is secreted within the first two hours. Pyelography should also be done to find the function of the kidneys. It has been done even when the blood urea was as high as 100 mgm. by Winsbury White. It also gives an idea of the existence of back pressure—hydronephrosis.

The amount of residual urine is estimated and its chemical examination and culture is done. It has been found that infection is the greatest bugbear in the surgery of the prostate. In the presence of infection it has been observed that the blood urea level rises and remains so till sepsis is cleared by chemotherapy and free drainage. Wilson Hey deprecates any instrumentation of the urethra lest sepsis be introduced into the bladder from outside. He does not advise indwelling catheter or suprapubic drainage but performs one step prostatectomy in cases of retention urine. The results are good in his hands though this practice is not followed by many urologists. The blood urea level has been seen to drop in our cases after decompression of bladder which is mostly done by indwelling catheter.

Diagnosis of Malignant Prostate—Symptoms of carcinoma of prostate are the same as those of benign hypertrophy but pain, hæmaturia and obstruction are frequently present either alone or together. Sometimes the early symptoms are those due to secondary deposits in the pelvis, spine or liver. These cases come with persistent pain in the back or sciatica.

In many cases the malignancy is not suspected until after the removal and histological examination of the prostate. Five of my cases were diagnosed as such but they have remained well so far and have not reported themselves as yet, with any complaint. A hard nodule found in the prostatic bed should rouse the suspicion of malignancy as also the difficulty in enucleating a part or whole of the gland.

Hæmospermia in a case of enlarged prostate is suspicious of secondary malignancy. In cases where rectal examination reveals undue hardness or nodularity, carcinoma should always be suspected and a prostatic smear should always be examined by Papanicolaou's stain. In four of our cases it was found positive for carcinoma cells.

A punch biopsy by a needle introduced through the perineum may be done and has given a positive report of malignancy in three of our cases.

Treatment

First method—The present tendency is more for a one stage prostatectomy, unless the kidney function is very bad and there is retention of urine and infection of the bladder or kidneys. The results of one stage prostatectomy during acute retention has been very disappointing in our hospital because the patients came late with severe kidney damage (blood urea being 200 mgm. per cent or more) and there is more risk of infection of the bladder because of instrumentation elsewhere or in the emergency department. Wilson Hey had good results with operation during acute retention. Winsbury White advises pyelography to know the function of the kidneys before operation, provided the blood urea is not above 100 mgm. per cent. Hey passes retrograde catheter from the bladder to prevent ascending infection. He performs primary closure of the bladder after diathermy coagulation of all bleeding points in the prostatic bed, in all his one stage removal of the prostate. He first determines the function of the kidneys by the blood urea with concentration tests and PSP excretion tests. If possible pyelography is also done to determine the kidney function; the urine is examined for pus cells and albumen, and is cultured. In the presence of infection and acute or chronic retention of urine, chemotherapy and an indwelling catheter are used till the former clears up and the blood urea falls at least to 30 or 40 mgm. per 100 ml., or PSP excretion is at least 20 to 30 per cent of the dye injected.

In the presence of gross infection, high blood urea or if the passage of a rubber catheter is difficult or if the indwelling catheter is not tolerated due to sensitiveness of the patient or urethritis, suprapubic cystostomy by a small incision and introduction of self-retaining catheter in the bladder is performed.

The prostate is enucleated by the Freyer's method after about a fortnight or a month when the blood urea has fallen and the infection has cleared. The patient is allowed to get up on the 3rd day and move about. He is encouraged to drink plenty of fluids and eat fruits and a vegetarian diet.

In districts where laboratory examinations cannot be made the general condition of the patient, specially his alertness and activity, moistness of the tongue and high specific gravity of the urine are the best guides to the function of the kidneys and I have never been let down by not having the facility of blood urea estimation and urea clearance tests.

In the one stage operation of Freyer's prostatectomy, the operation is easily perfomed with full retraction of the abdominal wall, the prostatic bed can be visualised and bleeding points ligatured.

The enucleation of the prostate should be effected with a gloved finger and without the introduction of a finger into the rectum, which may be required in fat subjects and fibrosed or malignant prostates. Packing of the prostatic bed should be avoided as far as possible or if at all, a paraffined gauze pack may be used for 24 hours if the bleeding does not stop. Gelfoam hæmopack may be used effectively for checking the oozing of blood. Retraction of the abdominal wall becomes difficult in the two stage operation.

A Foley's catheter is used for drainage and slight hæmostasis is brought about by pulling the catheter downwards and attaching it to the thigh by an adhesive plaster. A suprapubic tube is always put in for 3 days and thereafter the wound is dressed 4 hourly till it heals up in 10 to 12 days' time, if the Foley's catheter drains effectively. I have not closed the bladders as Wilson Hey or Harris does, as this requires a thorough hæmostatis in the prostatic bed and sterile urine. In fat subjects I had a great deal of difficulty in enucleating big sized prostates as it is difficult to reach even the vesical neck through the fatty abdominal wall. Such patients are fit subjects for perineal prostatectomy. The latter operation is even now perfomed in Baltimore and Washington for senile hypertrophy. Its chief complications are perineal fistula, stricture of urethra, incontinence and infection.

2. *Second method*—A transurethral resection is done in America by a Thompson's cold punch or by a MacCarthy's or Nesbit's resectoscope through a diathermy loop and the whole prostate is removed in one sitting. It requires much experience to remove the prostate *in toto* by this technique and to learn when to stop cutting on visualising the capsule. This technique is recommended for cases of fibrous prostate, median bar and middle lobe enlargements only. It may be used for cases of carcinoma of the prostate with obstruction. Only the obstructing tissue is removed. The following are the varieties of techniques in transurethral resection:—

1. Young's cold punch—blind—not usually practised.

2. Caulk's cautery punch—blind—not usually practised.

3. Coagulation under vision.

4. Cutting diathermy loop under vision by MacCarthy's or Nesbit's resectoscope.

5. Cutting loop or cold punch as used by Thompson under vision with endotherm coagulation of bleeding points.

The great advantage of transurethral resection is the short hospitalisation period. It is also not devoid of risk as a suprapubic cystostomy may be required if bleeding is serious. This technique cannot be adopted in the presence of slightest sepsis or renal insufficiency.

3. *Third Method*—Harris's one-stage prostatectomy with closure of the bladder can be performed only when renal function is good and there is no residual urine or infection. The prostatic urethra after the enucleation of the prostate is reformed by inserting 3 or 4 vertical stitches placed anteriorly and posteriorly and uniting the trigonal flap to the torn end of the urethra around a self-retaining catheter. A circular stitch may also be placed in the prostatic bed near the vesical neck to narrow the wide opening left after the removal of the prostate. Morson and Kenneth Walker have reported good results by this operation. The former practises primary closure of the bladder only if there is no sepsis and there is perfect hæmostasis. Harris's method has lost popularity during recent years.

4. *Fourth Method*—Millin's retropubic prostatectomy: This operation is indicated when one-stage suprapubic prostatectomy or Harris's operation would be suitable in the absence of sepsis and with good renal function. The operation is technically difficult but the mortality rate is low and the convalescent period is very short, *i.e.*, about 10 to 12 days, after the operation. Millin has performed retropubic prostatectomy after a preliminary cystostomy where indicated. Where cystourethroscopy was not possible earlier, it is carried out before the operation. The bladder is inspected for any concomitant pathology and the prostatic urethra is inspected to establish the exact confines and dimensions of the enlargement. No catheter is passed in the beginning except when the obstruction is due to fibrous, calculous or carcinomatous gland which are all removed through the retropubic route by Millin.

By a transverse suprapubic incision the retropubic space is opened and the leash of veins in the prevesical layer of pelvic fascia is ligatured on the anterior and lateral surfaces of the capsule or prostate. Sometimes no such vessel is visible but all the fatty tissue is cleared from the capsule by gauze dissection. Millin has given up ligaturing the leash of veins due to annoying bleeding caused by puncture of veins.

By a diathermy knife a horizontal incision is made on the prevesical fascia and capsule which is slightly convex downwards. The edges of the capsule are caught by T-shaped capsule forceps or artery forceps and the adenoma is enucleated by passing the finger between it and the separated capsule. The enucleation is effected from below upwards; the anterior wall of the urethra being cut across deliberately as far proximally as possible to prevent injury to the membraneous portion of the urethra. Both the lateral lobes and the middle lobe if any, are removed by this finger dissection and a wedge-shaped piece of the posterior half of the vesical neck is cut with scissors. The spurting vessels are caught and ligatured and the prostatic bed is packed with hot saline gauze. The bladder cavity is explored by introducing a finger for any stone or missed middle lobe. The prostatic bed is visualised for any portion of the gland left or any bleeding point, which is cauterised. A Foley's catheter is introduced

per urethra till the ballooned end lies in the bladder cavity.

The incised capsule is sutured by interrupted chromic catgut stitches. A piece of gelfoam is placed over the sutured capsule to effect perfect haemostatis. The self-retaining retractors are removed and the abdomen is closed with a drain in the cave of Retzius. About 2 or 3 ounces of sodium citrate solution 3·8 per cent is introduced into the bladder through the catheter.

During postoperative treatment, care is taken to see that the catheter does not get blocked with clots. If it does, irrigation with normal saline would be useful. The suprapubic drain is removed on the 4th day and the patient is fit to be discharged on the 12th day. The indwelling catheter is removed after 3 or 4 days by me, although Millin removes it on the 3rd day.

I have operated on about 12 cases and all were dry surapubically and were passing urine freely on the 8th day. Bilateral vasectomy should be performed as a routine, whatever procedure of prostatectomy is adopted to diminish the incidence of epididymitis. The surgeon who embarks on the surgery of the obstructing prostate must be prepared and equipped to deal with all types of cases and no single operation would prove adequate for the variety of pathological conditions met with.

For a general surgeon the two stage method Freyer's prostatectomy is the safest and the best and will have least mortality. The one-stage Freyer's operation should be preferred when indicated. The type of late cases that we see coming to the hospital with acute retention and dehydration, the two stage method is the only recourse to treatment. I have tried an indwelling catheter for a few days before performing suprapubic cystostomy in the dehydrated cases with chronic retention of urine. Sometimes the suprapubic drainage and sudden decompression of urine has produced uraemia, more so with an infected bladder and kidneys.

If the indwelling catheter is tolerated, well and good; otherwise suprapubic drainage by a self-retaining catheter is effected. Bilateral vasectomy should always be performed after suprapubic drainage operation. The individual surgeon should stick to the technique of prostatectomy which he has mastered, but I am impressed with the good results and low mortality of Millin's retropubic operation, from the short experience of my cases and a study of the record of cases treated by Millin himself.

This operation should not be attempted till there is good spotlight, suction apparatus and diathermy. Among the instruments required, a self-retaining catheter, boomerang needle, suture carrier, bladder-neck right-angled retractor and Foley's catheter are essential.

The operation should preferably be performed under spinal anaesthesia. It takes longer time than the Freyer's technique, but the reward is primary wound healing with early convalescence. Millin stated the mortality percentage of two step operation as 8 per cent and of Harris's 10 per cent. His fatality for transurethral resection is 4 per cent. His own operation has a mortality of 1·5 per cent. The mortality of my cases is 3 to 4 per cent for the two-stage operation and nil for the one-stage operation as yet, except those operated with acute retention of urine all of whom died. None of my cases who had Millin's retropubic prostatectomy done died.

TREATMENT OF CANCER OF THE PROSTATE: It would be better to divide these cases from the point of view of treatment into four categories.

1. *First type*—The cases which are diagnosed by rectal examination, to be malignant and are operable. These cases should be operated by Young's perineal prostatectomy with the removal of prostate, its sheath, seminal vesicles, terminations of vas deferens, prostatic urethra and the lower part of the trigone. The neck of the bladder is united to the urethra, by end to end anastomosis. When the nodules in the prostate are of doubtful malignancy, a portion is excised for frozen section examination before proceeding to a radical operation, if preliminary biopsy through the perineum had not been performed.

2. *Second type*—The second type of cases are those where there is no suspicion of malignancy on rectal examination but during a suprapubic removal of the prostate its enucleation is difficult and thus a suspicion arises or the diagnosis of carcinoma is given after histological examination by the pathologist.

There were seven such cases where the report of early malignancy was given after removal of prostate for senile hypertrophy. Such cases should be operated again by suprapubic or perineal route and total removal of the capsule and seminal vesicles should be performed. This practice has not been adopted by me but I have seen it in American urological clinics, where during the radical operation in the second stage they go to the extent of removing all the pelvic glands retroperitoneally by lateral abdominal incision on both sides on the principle of doing a block dissection.

3. *Third type*—In advanced cases, those with obstruction or which do not respond to castration, palliative transurethral resection or palliative suprapubic cystostomy should be performed to allow free passage of urine.

4. *Fourth type*—In extensive enlargements or small prostate with bony metastasis the following treatment should be adopted:—

(*a*) Surgical castration—Randal reported in 1942, that he had treated five cases by orchidectomy supplemented by transurethral resection. Nesbit and Cummings treated 75 patients of whom 45 remained

well for 21 to 36 months. Huggins has reported that 50 per cent of his cases improved in health and had amelioration of symptoms of dysuria. He has reported that orchidectomy has an antiandrogenic effect on the cancer and there is a fall of acid phosphatase content of the blood. The effect is not lasting but the cure by 5 year survival is 20 per cent only. There is a marked reduction in the size of the prostate and improvement in the symptoms of urinary obstruction. I have performed bilateral orchidectomy in five cases with beneficial results and they have to be followed for their survival period. One of them returned with reopening of suprapubic wound. In this case a stone was found in the bladder which was removed; thereafter the patient improved and began to pass urine. The enlarged and nodular prostate melts away under the effect of this operation.

Both the testicles are removed by a single incision and the epididymes are left untouched. The latter can be felt as small hard masses in the scrotum without producing any psychological effect due to the absence of testes.

The technique now used is bilateral subcapsular orchidectomy or evisceration. The tunica albuginea is incised and the glandular elements are scraped out from its interior.

(*b*) Surgical castration increases the urinary œstrogens and decreases the urinary androgens, but increases the pituitary gonadotrophic hormones. Huggins found that the administration of œstrogens reduced the hyperplasia and acid phosphatase of the blood. Herbert applied this work in the treatment of cancer of the prostate and suggested that physiological castration could be effected by œstrogen inhibition of the gonadotrophic function of the pituitary gland. Œstrogen increases the urinary œstrogen and decreases the urinary androgens but reduces the pituitary gonadotrophic hormone. In addition to its effect on pituitary, œstrogen exercises a specific effect on tumour cells. Thus for the purposes of physiological or pharmacological castration stilbœsterol tablets are given in doses of 5 mgm. to 15 mgm. daily for one month followed by doses of 1 mgm. Another drug is ethinyl estradiol which is given in doses of 0·05 mgm. daily for thirty days followed by a rest of 30 days.

(*c*) Radiological castration has been used for the treatment of cancer but Huggins found that the interstitial cells of the testes could not be destroyed by radiation.

(*d*) Irradiation therapy by high voltage deep x-ray and radium have not been satisfactory because adequate radiation of the prostate cannot be obtained without danger to the vitality of the bladder and rectum.

I have combined stilbœsterol therapy with bilateral orchidectomy with good results and if obstruction is present either an indwelling catheter is introduced or a palliative suprapubic cystostomy is performed. These patients start passing urine, as the size of the prostate diminishes. If micturition remains difficult after castration, transuretheral resection of the prostate may be performed just sufficient to canalise the urethra.

POSTOPERATIVE TREATMENT: It would not be proper to close the subject without few lines about the treatment after operations on the prostate. The following steps are generally taken:

1. Injections of penicillin 50,000 units 4-hourly are begun a day before the operation and continued for 2 or 3 days after. Streptomycin 0·5 gm. 12-hourly may also be given for 5 or 6 days till the temperature is normal.

2. Fluid intake is encouraged in the form of barley water and fruit juices. Fluids are given up to 2000 ml. intravenously or 1000 ml. by intravenous route and 1000 ml. tap water by rectal route. I prefer to give 5 per cent glucose in redistilled water one pint and normal saline one pint. If there is hiccough or signs of uræmia only 5 per cent glucose in redistilled water is given. Chloretone 10 gr. placed on the tongue and sucked is effective in stopping hiccough. Intravenous fluid is given for 3 or 4 days after operation or till the patient starts eating solid food and drinking plenty of water.

There were about 120 cases of enlarged prostate treated during last 3 years of which about 80 per cent of cases came with acute retention of urine. Twenty per cent of the cases had benign hypertrophy with chronic prostatitis. Twenty five per cent of cases were carcinoma prostates. About 80 per cent of cases had blood urea above 50 mgm. per 100 ml.

CONCLUSIONS

1. When the blood urea was 40 mgm. or below and no infection of urine, one stage suprapubic prostatectomy or retropubic prostatectomy was performed.

2. Cancer of the prostate could be diagnosed by perineal biopsy and prostatic smear examination.

3. Bilateral orchidectomy combined with stilbœsterol therapy gave very good results with almost complete reduction in size of the malignant prostate.

4. Fibrosed prostates and enlarged prostates in obese patients are not suitable for suprapubic operation. In the former, transurethral resection is indicated and in the latter perineal prostatectomy.*

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NUTRITIONAL ŒDEMA LEADING TO SPONTANEOUS HYPOGLYCÆMIA

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The liver acts as a buffer between the gut and the circulating blood. It functions as a reservoir for the storage of glycogen derived from glucose and certain amino acids, absorbed into the portal circulation from the gut. It discharges glycogen into the blood as glucose whenever there is a demand for it for tissue oxidation and thus maintains the sugar level within normal limits. A rise of blood sugar level beyond the kidney threshold of 180 mgm. per cent is reflected by leakage of sugar by kidney and glucosuria results. The normal requirements of tissue are adequately met so long as the sugar level in the blood is 80—120 mgm. per 100 c.c., any extra requirement being satisfied by conversion of glycogen stored in the liver into glucose.

Any omission, neglect, delinquency or deterioration leading to disturbed sugar level of blood in either direction, whether excess or deficit, resulting in deflection of sugar metabolism, causes a train of symptoms leading eventually to coma, convulsion and death.

The sugar level of blood depends on its assets and liabilities. The income is partly from the absorption of hexoses from carbohydrates of the food and partly from the production of glucose in the liver from certain amino acids and the output is by oxidation by tissue cells for their energy requirements in the process of conversion of glucose into CO_2 and water. The adjustments are effected, however, through the intervention of various enzymes and certain hormones. Of these insulin acts by depleting the sugar level of blood, whereas adrenal, pituitary, thyroid and possibly corticosterone act in the opposite way by raising the sugar level.

Banting (1922) was first to show that insulin in overdose caused hypoglycæmia. A condition of shock attributed to hypoglycæmia, not due to insulin actually introduced from without, was first demonstrated by Harris (1942). He named it hyperinsulinism. Wilder and others (1927) showed that the said condition was due to tumours of the islets of Langerhans. Later workers established the clinical entity of spontaneous hypoglycæmia outside the domain of pancreatic tumours including functional hypertrophy or hyperplasia of the islets. These are:—

(*a*) Diminished or defective absorption of glucose from the gut, as in certain diarrhœas, sprues etc.

(*b*) Failure of the liver to perform its glycogenic function in carbohydrate metabolism from acute yellow atrophy of the liver, primary or secondary hepatic carcinomas, cirrhosis, *i.e.*, von Gierke's disease, arsphenamine and other poisonings, ascending cholangitis, etc. or from defective or restricted supply of amino acids in food which is converted into glucose as in undernutrition and hypoproteinæmia.

(*c*) Endocrine glands acting antagonistically to insulin might be unequal to neutralise insulin effect or fail to inhibit or control pancreas to produce lesser amount of insulin, as in Simmond's disease (pituitary cachexia), myxœdema, Addison's disease, etc.

(*d*) Rapid utilisation or depletion of sugar in the blood, without giving sufficient time to the liver to adjust the blood level by conversion of glycogen or certain amino acids to glucose, as in prolonged exertion entailed in and usual in Marathon races.

(*e*) Rapid elimination of sugar in urine, as in renal glycosuria.

(*f*) Certain nervous states, as in general paralysis of the insane, various psychotic states, subdural hæmorrhage and vasovagal attacks are associated often with hypoglycæmia. Possibly the hypothalamic control of blood sugar is disturbed in these conditions.

The symptoms of hypoglycæmia are due to insufficient quantity of blood sugar available to the central nervous system which utilises only glucose, aceto-acetic acid and glutamic acid (Duncan, 1947). The level of aceto-acetic acid is so low in blood that it could be neglected as a source of energy to the nervous tissues. Nerve tissues depend only on glucose and glutamic acid for their metabolic requirements. Hence, when blood sugar falls, the nervous system objects by giving rise to the symptoms of mental aberrations, convulsions and coma.

Four factors seen to operate in the production of hypoglycæmia in nutritional œdema. They are:—

(*a*) Limitation or reduction of available amino acids to be transformed into glucose by the liver from hypoproteinæmia.

(*b*) Limitation of available amino acids in blood containing glutamine. Hamilton (1945) has shown that glutamic acid is present in plasma either in free state or in asociation with other amino acids. It is possible that along with the reduction of protein in blood in nutritional œdema, the level of glutamic acid is also reduced thereby, imparting the hypoglycæmic glutamic acid depletion symptoms on nervous tissues.

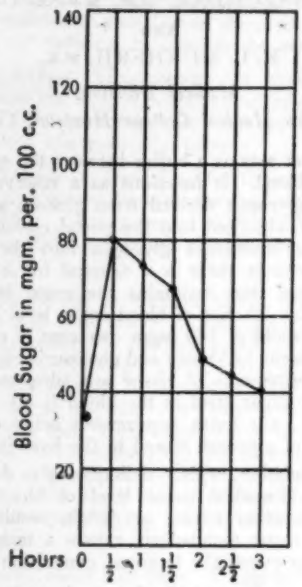
(*c*) The association of nutritional œdema with defective absorption is well known. Diarrhœa and sprue syndrome may produce hypoglycæmia by deficient absorption even though food and nourishment were adequate.

(*d*) The undernutrition of nutritional œdema may be in respect to both proteins and carbohydrates. Not every case of nutritional œdema is threatened with hypoglycæmia; the carbohydrate of the food could sufficiently recompense for the deficiency in glucose-producing amino acids. But in food depletion and deficiency in respect to both protein and carbohydrate of which the latter factor admittedly is more important in glucose production, when adversely operate along with absorption defect, as in diarrhœas, hypoglycæmia is precipitated.

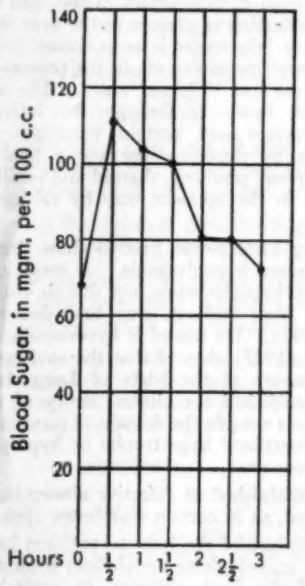
Three cases exhibiting symptoms of spontaneous hypoglycæmia, in subjects admitted for nutritional œdema, are recorded below.

Case Reports

Case 1—P. S. a young Oriya aged 30 years, a cultivator, was admitted to the hospital on 22-11-49 for swelling of the whole body of two months' duration. He was found pale, dyspnœic with accessory muscles of respiration working. There was general anasarca, skin was scaly and fingers had a tendency to clubbing. The tongue was moist, pale almost like a blotting paper and denuded of papillæ. Free fluid was detected in the peritonæal cavity. Breath sounds were harsh and expiration was prolonged. He was diagnosed as a case of nutritional œdema with anæmia and emphysema. His serum protein was 5·00 per cent, albumen 2·19 per cent and globulin 2·81 per cent. Hæmoglobin was 46 per cent (Hellige); R.B.C. 2·4 million per c.mm.; P.C.V.—22 per cent, M.C.V.—91·6, cu. microns, M.C.H. 27·7 micro micrograms, M.C.H.C. 30·3 per cent. Kahn test was positive. Urine did not contain any albumen or sugar, stool was semi-solid containing undigested food, starch granules and vegetable matters. Gastric analysis showed hypochlorhydric curve. He was kept on diet containing 95 gm. of protein, 350 gm. of carbohydrate and 60 gm. of fat. It also contained fresh liver 6 ozs. Iron, diuretics and vitamin B complex were prescribed. He was also having injections of marsalyl every 4th day preceded by ammonium chloride gr. 15 thrice daily. He started having diarrhœa on the 9th day of admission. So diet had to be switched down to plain buttermilk. His mental equilibrium was found to be a bit disturbed, specially in the morning, *i.e.*, before breakfast. Two days later, *i.e.*, on the 11th day of his admission, he was found unconscious in his bed. On examination he was found deeply comatose, the breathing was stertorous, pulse 90 per minute, volume and tension were weak; extremities were cold, and he sweated profusely. He passed urine and stool in bed involuntarily; the plantar response was extensor; all the deep jerks were lost. Glucose 25 per cent 50 c.c. I.V. with adrenaline 1 in 1000,15 minims subsutaneously brought back the consciousness and he made a rapid recovery. Fasting blood sugar was done the next morning and it was found to be 35 mgm. per 100 c.c. Glucose tolerance curve was as in Graph 1. This reflects the effects of reduced intake. After recovery from the attack and after improvement from diarrhœa, he was again allowed his former diet. After he had this liberal diet for 3 days his glucose tolerance curve was repeated; it was found to be as in Graph 2. The latter differed from the former curve (*cf.* Graph 1 which was more hypoglycæmic). On the 18th day of admission, he suddenly got a temperature. B.T. trophozoites and gametocytes were found in his blood. Though antimalarial drugs were pushed, he died two days afterwards.

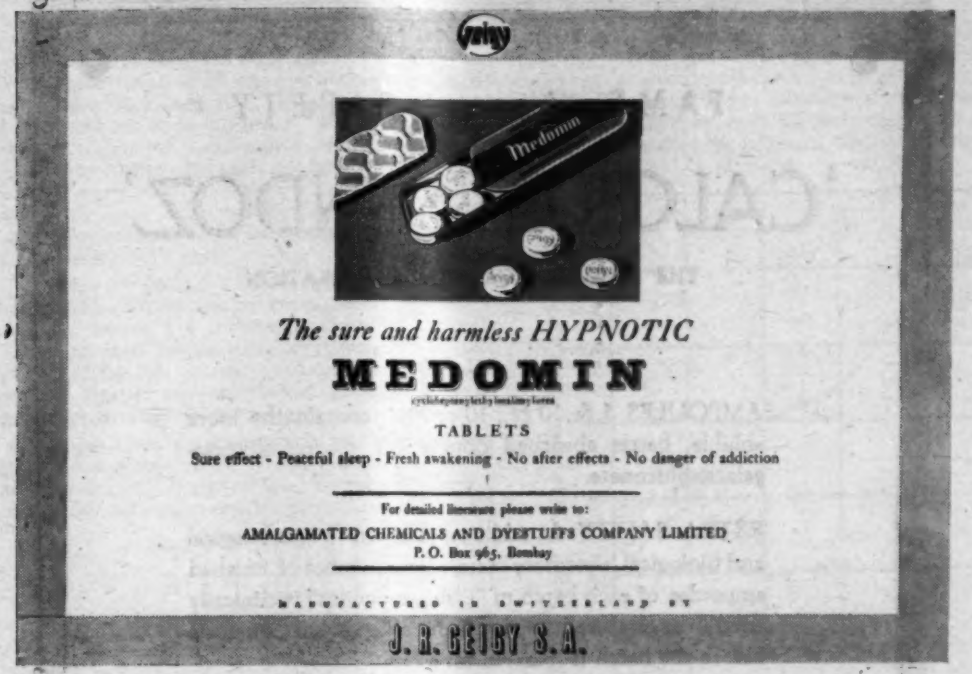


Graph 1



Graph 2

Case 2—The patient R. K. aged 48 years, a manager of a bank was admitted on 2-8-49 for indigestion and flatulence of one year's duration. He was suffering from chronic diarrhœa and passing loose stools mixed with mucus, 4-5 times a day on the average. There was marked loss of appetite and he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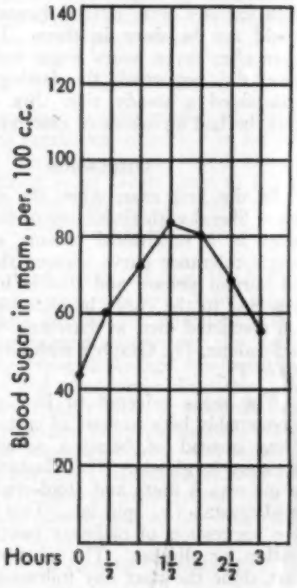
avoided meat, fish or milk as nourishment. His emaciation was marked and during the course of last six months he had reduced considerably, almost to skin and bones. The skin was scaly and feet were œdematous, tongue denuded of papillæ, abdomen scaphoid; there was a mass occupying the epigastrium and part of right and left hypochondrium. It was fixed to the posterior abdominal wall, slightly moveable from side to side, firm, upper edge could not be defined; the mass did not move with respiration; surgeon consulted thought the mass to be mesenteric glands which emaciation and extreme undernourishment made palpable and detectable with ease.

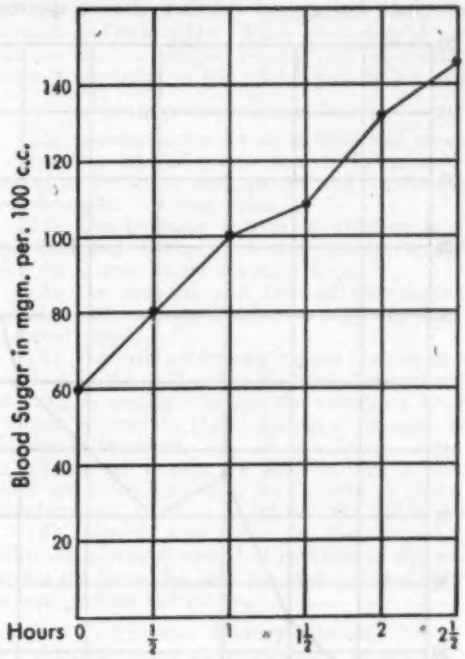
Laboratory findings—Blood: hæmoglobin—60 per cent, R.B.C.—3·2 million per cmm., serum protein 5·2 per cent, albumen 1·4 per cent, globulin 3·8 per cent. Urine contained no albumen or sugar. Stools contained undigested starch granules and vegetable matters. Gastric analysis showed achlorhydria, even after administration of histamine.

He was given an acid mixture and iron and was allowed diet containing 60 gm. of protein, 200 gm. of carbohydrate and 50 gm. of fat. Because of anorexia he could not take much nourishment. One evening, 26



GRAPH 3

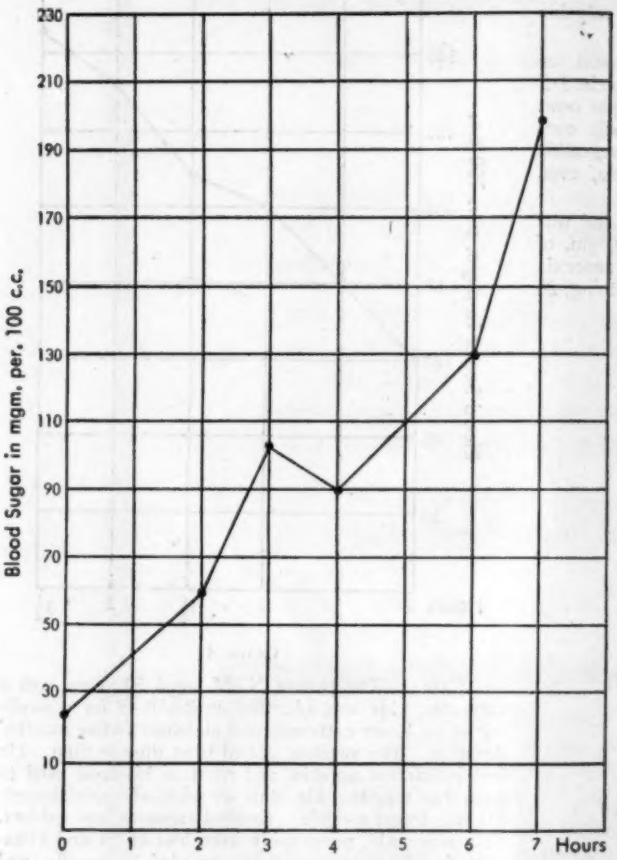
days after admission to hospital, before dinner, apparently on a fasting stomach, he suddenly began to behave queerly and became unstable and drowsy; his hands and arms began to twitch and he gradually became unconscious. There was drenching perspiration which almost soaked his clothes; his extremities became cold. He passed urine and stool involuntarily. The stool had a peculiar musty odour. Glucose 50 per cent 50 cc. with adrenaline 1 in 1000, were given. This brought him back to consciousness rapidly. Fasting blood sugar was done the following morning and it was 30 mgm. per 100 cc. The glucose tolerance curve was done the next day and the results were as in Graph 3. The case could not be investigated further as suggested by Conn (1940) *i.e.*, testing sugar tolerance after ingestion of 350 gm. carbohydrate daily for three days prior to the test because he died the following day. No permission for autopsy could be obtained.



GRAPH 4

Case 3—The patient N. M. aged 50 years, was a carpenter. He was admitted on 22-10-49 for a swelling of the lower extremity and abdomen of five months' duration. The swelling varied from time to time. He had indifferent appetite and most of his food used to burn his tongue. He thus avoided all nourishment. He was found anæmic. General anasarca was evident. Skin was scaly, presumably from loss of fat and avitaminosis. Tongue was pale, denuded of papillæ and stomatitis was present. Abdominal free fluid was easily detected. The liver and the spleen could not be palpated. The chest was hyperesonant and a few moist sounds were audible at both bases. Heart sounds were feeble. He was running an irregular temperature; the pulse rate was rapid and the blood pressure read 110/50 mm. Hg. The urinary output was low, about 16 ozs. daily, on an average. There was no albumen or sugar. Stools were loose, no ova or cysts detected; it contained undigested food matter. Blood: hæmoglobin—32 per cent (Hellige); R.B.C.—1·65 million per c.mm.; W.B.C.—9,450 per c.mm.; polymorphs—80 per

cent, lymphocytes—18 per cent, eosinophil—2 per cent; serum protein—4·9 per cent, albumen—2·4 per cent, globulin—2·5 per cent. Gastric analysis was not done. He was diagnosed provisionally as a case of nutritional œdema and anæmia; the cause of the low-grade infection giving rise to the temperature could not be ascertained. Sulphanilamide, however, brought down the temperature rapidly. He was now given high protein diet as also iron and liver extracts along with vitamin B complex. His general nutrition showed appreciable improvement when on the 18th day after his admission to the hospital at 6 A.M., before the morning milk was given, he became suddenly unconscious; the extremities became cold; there was profuse perspiration. He was in a state of shock. He was given 25 per cent 50 cc. glucose parenterally. This quickly restored the consciousness. On the 33rd day of his admission to the hospital, at the identical hour, *i.e.*, before the morning milk he had a repetition of an hypoglycæmic attack; he rapidly became unconscious the pulse became feeble, the rate was rather slow. The extremities were cold and the whole body became drenched in profuse perspiration. The pupils were slightly contracted, sluggish in reaction to light; the tension of the eye balls was moderate. The muscle tone was lost; the deep reflexes were absent. The plantar reflex was extensor. Blood was taken for sugar estimation and glucose 50 cc. 25 per cent given intravenously and adrenalin 1 in 1000, 15 minims was injected subcutaneously. Consciousness rapidly returned. The blood sugar in coma was found to be 17·5 mgm. per 100 cc. The results were checked, in view of the abnormally low figure, in the biochemical laboratory, by 3 estimations. This necessitated further enquiry into the state of blood sugar status of the person. The glucose tolerance curve obtained is shown in Graph 4. As the sugar level did not show any tendency to fall in ½ hourly estimations for 2½ hours and maintained an upward course, recourse had to be taken to obtain a sugar tolerance test for a longer period, to ascertain when the curve reached the fasting level. This is shown in Graph 5. The first and the fifth samples were clotted, hence estimation could not be done in them. Here again, even after seven hours' sugar estimation the level did not reach the fasting point but naintained a steady rise. Six days after this, he had an attack of diarrhœa and died.



GRAPH 5

DISCUSSION

In the first case, when the diet became more liberal with abundance of carbohydrate, even in a nutritional œdema subject, the sugar tolerance curve showed the character of normal person and this is in a marked contrast to the curve he showed when kept on restricted diet, in diarrhœa, with buttermilk alone, (*cf.* Graph 2 with Graph 1 under Case I).

The mass referred to in Case 2 could presumably be a tumour of islets of Langerhans instead of being a simple mass of mesenteric glands. The diastatic index of urine was 8 units and stool contained fatty acid crystals *i.e.*, split fat. This was against the suggestion of ordinary pancreatic aberration or disease. The glucose tolerance test, done the next day following the hypoglycæmic attack, is shown in Graph 3. Had it been a case of spontaneous hypoglycæmia due to hyperinsulinism, produced by tumour of the islets, the fasting level of sugar would have been low. But after administration of glucose, the sugar level would have risen in the first hour, somewhere near 90-120 mgm. per 100 cc. This rise in glucose should have stimulated the pancreas further which was hyperactive, to produce more insulin and the blood sugar would have fallen below the fasting level in less than 2½ hours.

Had it been due to hepatic insufficiency, the fasting sample would have been low. After glucose administration, it would have risen to a level, say, 120 mgm. per 100 cc. in the first hour and would have maintained the level or risen persistently for 3-4 hours as liver no longer acted as glycogen storage depot and all the sugar must go to the blood so long absorption took place. The blood sugar would fall only after it had been utilized in tissue metabolism. Naturally the curve would be a prolonged one.

In the third case under discussion, the blood sugar level during coma was 17·5 mgm. per cent; 60 mgm. per cent was the first and 25 mgm. per cent the second fasting level. But the striking fact was that the sugar did not reach the fasting level, even after the 7-hour tolerance estimation and maintained a persistent rise. This is unlike normal blood sugar curves. Ordinarily sugar absorption is complete in 4-6 hours. Evidently there was some inherent defect in absorption leading to a prolonged rising curve. Hepatic disease or insufficiency could easily lead to defective nutrition. Normally liver acts as a brake on excessive rise in blood sugar due to uncontrolled or unchecked absorption direct from the gut. Hepatic insufficiency may not be the only factor. The disturbed absorption was beyond restrain. An erratic action of the pancreas might also contribute to this phenomenon.

Conclusions

Spontaneous hypoglycæmia occurred repeatedly in 3 cases of nutritional œdema. In the first two cases the fasting blood sugar was found low. After sugar meal, the blood sugar levels came to the original level in scheduled time, showing the defect to be in nutrition in respect to available carbohydrate and protein intake or absorption.

In the third or the last case, the blood sugar curve maintained a steady rise even after the seventh hour which is much beyond the scheduled time for the level to return to normal, apparently due to defective absorption or deranged storage mechanism in the liver. So perilous and abundantly disastrous was the dislocation of blood sugar level, so obdurate and erratic yet persistent was the rise maintained, that all natural barriers and boundaries were over-stepped in a single sweep, that one could seldom apprehend where the mad unrestrained upheaval would come to a crash or get crushed under the weight of its own exuberance.

Acknowledgment

Thanks are due to Capt. K. L. Sen, M.B., F.R.C.S. (E), D.O.M.S., Superintendent, Lake Medical College Hospital, Calcutta, for his kind permission to publish the paper.

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RUNNING EAR IN CHILDREN

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New Delhi.

Introduction

Running ear in children is a common condition and may give rise to serious complications if not treated promptly and thoroughly. Many adult cases of partial deafness start as simple running ear in childhood. Hence a discussion of the subject may be interesting.

Salient Anatomical Facts

The essential points for us to remember are—

(1) The mastoid process in a child's ear is in the process of formation and upto puberty or thereabout pneumatisation is taking place.

(2) The tympanic antrum in children is very superficial and covered by a thin lamella descending from the squama of the temporal bone.

(3) The temporal bone (like all other bones) in a child is extremely vascular, which helps any infection to spread rapidly.

(4) The external acoustic meatus is about an inch long both in the child and in the adult, but in the child the canal is cartilaginous and the membrana tympani is almost horizontally placed, instead of the acute angle it forms in the adult.

(5) In the infants, the auditory tube is shorter, wider and more horizontal, thus making it easier for nasopharyngeal infection to get into the middle ear.

(6) Adenoid vegetations in the nasopharynx which are a fruitful source of infection of the middle ear *via* the eustachian tube are most common between the ages of four and fifteen.

Clinical Manifestations

Running ear means an ear that is discharging pus, muco-pus, serous or sanguinous or a combination of these. It usually implies a chronic suppurative otitis media and a perforated membrane so that discharge may come out. It often means neglect, malnutrition, poor education, lack of health consciousness and haphazard treatment. In other words, running ear in children accurately demonstrates the state of social consciousness in an area or country.

With proper treatment, running ear can be stopped and the child's life can be made happy from a miserable or at least an apathetic existence. In adults, except in cases of trauma and some exanthematous diseases *e.g.*, typhoid fever, running ear is usually a sequela of neglected running ear in childhood.

The beginning is almost always an acute otitis media (catarrhal or suppurative). It is most frequent during the first two years, particularly in badly nourished children. Infection of the ear by meconium in infants has been ascribed as a cause for this.

The usual routes of infection are from the—

(1) Nasopharynx, adenoids and tubal tonsils through the eustachian tube to the middle ear.

(2) Infection from generalised exanthematous discases, some of which have a special predilection for ears, *e.g.*, measles, influenza, typhoid fever, diphtheria, mumps, scarlet fever.

(3) Traumatic infection from outside. Child injuring his drum with a stick or somebody trying to clean the child's ear in a well-meaning, but ignorant manner.

(4) Bovine tubercular infection from milk is very common in Scotland and some parts of America.

The usual causative organisms are streptococcus, staphylococcus, pneumococcus type III, B. pyocyaneus, Aspergillus niger and tubercle bacillus in certain areas.

Recognition—A child does not complain of pain easily, nor is he conscious of his disease in the same way as an adult. Parents and doctors have to be alert to see whether anything untoward has happened or not to the child. The child may not complain of *pain*, but he may cry out for no reason, particularly at night. He may frequently touch his ears in a vain attempt to find out the cause of his ailment. *Mastoid tenderness* is usually not present at this stage. Deafness will be subject to great variation and again the child is no reliable guide to his hearing. Temperature is often present with a range between 102°-103°F. Tinnitus is often present. Discharge is nil at this stage.

In a child, with unexplained temperature, who gives a history of occasionally touching the ear, an otoscopic examination should be carried out immediately. The normal translucent appearance of the drumhead will be replaced by congestion, bulging or retraction in various degrees according to the pathological condition present and will usually clinch the diagnosis. Rinne's test will often be negative, showing a certain amount of conduction deafness. But very often, particularly in India, the little patient is not brought at the beginning. Sometimes the child may have been injudiciously treated with sulphonamides giving rise to sulphonamide compound syndrome with its dreaded masking effect about which I shall deal in more details later on.

The child may make a spontaneous recovery or may pass on to chronic purulent otitis media with or without a patent perforation. A lot of damage has been done, the hearing has been impaired. He is now all set out for a chronic illness and liable to all the various complications. He is a source of continuous economic drainage, because he is never 100 per cent fit. His education, his health and his outlook suffer and if his loss of hearing is marked, then the walls round him are already closing in. It would ultimately leave him in the mausoleum of the living dead, where no voice would penetrate his perception.

Diagnosis

Diagnosis is no longer difficult. The child comes with—

(1) History of discharge from the ear, whose quantity and quality varies. Sometimes it stops, sometimes it has acute exacerbation.

(2) Pain is not a prominent feature.

(3) Deafness is gradual.

(4) Tinnitus may be present, but not often complained of by the child.

(5) Vertigo not important.

(6) Temperature—usually afebrile, except at the onset of an acute exacerbation.

(7) White blood cell count is seldom high. Usually round about 10,000 per c.mm. and instead of polymorphonuclear cells, lymphocytes may predominate.

(8) *Otoscopic examination* will not only clinch the diagnosis, but will show us the state of the disease.

(9) X-ray of the mastoid is a valuable adjunct specially to show the extent of the disease.

If the disease be neglected now, nature may step in and cure the patient, but usually leaving partial loss of hearing as a permanent stigmata. Or it may progress on to complications, some of the most important of which are enumerated below:

(1) Granulations, polypi and cholesteatoma formation.

(2) Mastoiditis.

(3) Labyrinthitis, phlebitis and lateral sinus thrombosis.

(4) Leptomeningitis.

(5) Otitic brain abscess—single or multiple.

All these will usually lead to a fatal termination, unless promptly and properly treated and all these need never occur, if we are careful in the beginning.

Of all the complications, mastoiditis is the commonest and can be subdivided into; (1) zygomatic, (2) apicitic, (3) tubal, (4) Bezold's according to the groups of cells infected. I hope that a reminder about zygomatic mastoiditis here, will not be redundant. It is an uncommon form of mastoiditis and therefore often not thought of.

It has gained general recognition by the works of Professor Holmgren, the doyen of Swedish otology, in 1921. It is most common between the ages of 5-15 years and pathologically is a suppurative otomastoiditis in the roots of the zygoma. Preformed track of cells is the commonest route of infection.

The most prominent feature is a *pre-auricular swelling* in the course of a running ear. A firm tumour covers the roots of the zygoma and often causes œdema of the lower eyelid. It is tender, but fluctuation and pointing of the abscess are signs long delayed in their appearance. Because of its position and rarity, its true nature is often mistaken. Fleeting trismus is common. Drum-head may vary from injection, bulging and perforation. Hearing tests are important, because impairment of hearing of varying degrees are elicited in all.

The otorrhœa is often stopped early in the course of the disease, giving a false sense of security. It stops because of—

(1) Early occlusion of air cells and often tympanum, by swollen muco-endosteum and pus escape to the zygomatic root and temporal fossa.

(2) Sulphonamide masking

The only treatment is operative, *i.e.*, a mastoidectomy combined with cleaning the cells at the zygomatic root.

The other complications require more space than available. They are well known entities, no doubt familiar to all.

A passing reference is made here regarding the relationship of otitis media to gastro-enteritis in infancy before actual treatment of the condition is considered.

Otologists and pediatricians in many countries have observed cases where associated with running ear, there is malnutrition, diarrhœa, malaise, fever, loss of weight and anhydræmia. It is still unsettled, whether the two are coincidental or there is a definite relationship. For our purpose it is well to remember that such a syndrome may exist and it is a good plan to look for aural conditions in all infants with gastro-enteritis.

Treatment

The main principles of treatment will be:

(1) to get a completely dry ear, which has to remain as such,

(2) to restore the loss of hearing, if it is possible, at least to prevent its further deterioration,

(3) to prevent all complications—fatal or otherwise,

(4) to restore the child's health to normal.

Here, as everywhere else 'prevention is better than cure'. It is sometimes easier said than done. But *early recognition* of an acute otitis media and its proper and prompt treatment would go a long way to achieve this aim. *Infected adenoids* should never be lost sight of. No matter how much we do for the ear conditions, unless the infected adenoids are removed in all cases of running ear in children, we have not eradicated the root of most troubles. Samuel J. Crowe and some other American otologists use irradiation in the form of direct radium application in a container, particularly for tubal tonsils. It has been tried in Europe too, but has been found rather cumbersome and not very satisfactory. It is mentioned here only to make the picture complete.

In our experience, adenoidectomy, completely done, is sufficient in removing the main source of infection.

Paracentesis—The value of timely paracentesis cannot be over-emphasised towards a complete resolution of the ear conditions. If the drum-head is red and has lost its normal concavity, immediate paracentesis must be done. In some not so early cases, where there is a tendency to quick closure of the incision, it may have to be repeated.

Sulphonamides and Penicillin—Like many other potent drugs the indiscriminate and inadequate use of sulpha group of drugs can do more harm than good. It lulls the patients and practitioners with a false sense of security. The awakening is often unexpected and *rude*. So much so that a definite clinical entity is now recognised by otologists known as "Otitis media-Sulphonamide compound syndrome."

The greatest drawback is in its masking effect on the classical picture of both otitis media and subsequent mastoiditis. With the drug, the pain stops, the temperature comes down to normal, sometimes followed by an irregular elevation, the aural discharge usually becomes scanty or nil, mastoid tenderness and pain if any, usually subside. Leucocytes come down. Drumhead shows thickening with alteration of the usual anatomical landmarks. Everyone is happy, while all the time, the disease is burrowing inside towards the dural and sinus plates.

Apart from a masked mastoiditis, sinus phlebitis and thrombosis, perisinus and extradural abscesses are not uncommon sequelæ. The one most important finding is that the loss of hearing does not show any improvement with sulphonamides in this stage. If we are to use sulpha drugs or penicillin, hospitalisation is necessary. But that is seldom a practical proposition here. The patient must be confined to bed or at least inside the house during treatment. The temperature should be observed every 4 hours and otoscopic examinations and hearing tests should be done every day. Early paracentesis to relieve tension, must be done. In most cases, paracentesis with general treatment is much more safe than sulphonamides.

Operation for mastoiditis should be undertaken with much fewer symptoms and signs in cases, where sulphonamide has been administered than where sulphonamide has not been used. The dosage should be adequate. Penicillin—15,000-25,000 units every three hours should be given until the ear is completely dry and remains dry for at least 3 days in succession and the temperature remains normal.

In the case of sulphonamides, the aim is to maintain 10 mgm. of the drug per 100 c.c. of blood during the course of treatment. Paracentesis must be done in all cases where the drumhead shows congestion and the slightest loss of its normal concavity. If all these rules are observed faithfully penicillin and sulphonamides herald a great advancement in the treatment of otitis media and all its complications. If these are used haphazardly these may produce dangerous results as shown before. I may mention here that in the University hospital at Oslo and Stockholm, during the years 1947-48 only one or two cases out of thousands had to undergo mastoidectomy when dealt with according to the above regime of treatment.

Chronic suppurative otitis media or pure running ear is either a neglected or a badly treated ear. In India, it is particularly common, because of our general low economic and educational level. Malnutrition, adenoids and neglected or maltreated otitis media are the three pillars on which running ear rests.

Discharge from the ear with alternate remissions and exacerbations, varying degree of deafness and different degrees of perforation of the tympanic membrane are its chief symptoms and signs. Pain, tinnitus, vertigo and temperature are not common. The disease has now entered upon its most dangerous and insidious course.

Diagnosis at this stage is not difficult, but its true assessment may not always be easy and its treatment needs the utmost patience and perseverance both on the part of the patients (or rather their parents) and the doctors. The essential part of the treatment is absolute cleanliness of the ear. The two recognised methods of treatment are:

(1) Wet method, and (2) dry method.

Wet method, *i.e.*, syringing the ear with boracic acid solution, drying out the ear with mops and Siegle's speculum and then instilling some antiseptic drops or insufflating antiseptic powder.

Various drops and powders are in use. From simple boric acid and spirit drops to picric acid, acriflavine, mercurochrome, guaiacol and creosote or silver nitrate, have all been used and so have, iodoform, sulpha, penicillin, tyrothricin. Some American otologists recently have recommended glycerite of hydrogen peroxide—4 per cent in anhydrous glycerine. Urea and phenoxytol (2 per cent) have been used recently with great success against bacillus pyocyaneus infection, which are resistant to most other drugs. Ordinary aural syringing, intratympanic syringing through a perforation in the drumhead, syringing the eustachian catheter have all a definite place according to the stages of the disease.

Dry method—In the dry method, no syringing is done, but the discharge is carefully mopped out and then any of the powders enumerated above are insufflated.

Zinc ionisation with a ½—1 per cent zinc sulphate solution in water has also been used. The secret of success is a perfectly clean ear each time it is cleansed. It must be seen under direct vision and repeated as often (may be two or three times a day) and as long as necessary (may be months), till we get a completely dry ear, which would remain so.

75 per cent chronic otitis media will be cured by these methods. Concommitant nasopharyngeal infections must be treated simultaneously.

The rest of the 25 per cent where complications, *e.g.*, cholesteatomæ, etc. have already set in will need surgical intervention and the sooner that is done, the better it is, so that any more complications are avoided, which may sometimes prove fatal. In most cases a radical mastoidectomy would be necessary.

Conclusions

Immediate and urgent treatment of acute otitis media is emphasized; paracentesis should never be delayed, when called for, nasopharyngeal infections should be eradicated at the earliest opportunity. Patience, perseverance, and cleanliness are the watchwords in the treatment of chronic suppurative otitis media.*

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SPECIAL ARTICLES

I

LABORATORY DIAGNOSIS OF MYCOTIC LUNG INFECTIONS

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The mycotic infections of the lung are certainly not so rare as is commonly believed. Their number also is not less than those of the bacterial and virus infections of the lung. These infections vary considerably in infectivity, and the disease, though mild, may be highly infectious. As such while the patient may not himself feel much discomfort, he may infect a good many others. The pulmonary mycoses are not very common, but they are sufficiently frequent to be considered in the differential diagnosis of obscure infections. Each mycotic infection is as definite and stereotyped as the pneumococcal lobar pneumonia but because of their comparative rarity, they are not encountered too frequently in routine medical practice. It would, therefore, he helpful if we have a clear conception of the various fungal infections of the lung.

The common pulmonary mycoses are the following:

Names	*Causative fungus*
(*i*) Moniliasis	Candida
(*ii*) Cryptococcosis	Cryptococcus neoformans
(*iii*) Actinomycosis	Actinomyces bovis & nocardia
(*iv*) Blastomycosis	Blastomyces dermatitidis
(*v*) Coccidioidomycosis	Coccidioides immitis
(*vi*) Histoplasmosis	Histoplasma capsulatum
(*vii*) Aspergillosis	Aspergillus fumigatus
(*viii*) Geotrichosis	Geotrichum candidum.

Diagnosis

Diagnosis depends on (1) isolation of fungus and (2) serological tests.

I. Isolation of Fungus

Examination of Sputum: Naked eye examination of the sputum does not afford much help. Mycological examination is the only sure step. Here also there is a snag. Some of the species causing pulmonary mycoses, for instance, those of the genus Actinomyces exist as saprophytes in the body cavities and also in the mouth, tonsillar crypts and carious teeth, Particles of other species such as Monilia are distributed widely in the air and are liable to be continuously inhaled by everybody, without producing serious deviations from the normal. It may, therefore, be argued that the detection of mycelium or spores or yeast cells in the sputum is scientifically no justification for diag-

nosing primary pneumomycoses. There is no denial to this fact and in these cases it is only the repeated isolation of the fungus from the sputum that is diagnostic.

Direct examination of the sputum—A bit of thick sputum is placed on a slide and covered with a drop of 1 per cent aqueous solution of cotton blue. A cover slip is then applied and plain lactophenol blue is drawn under the cover slip replacing the cotton blue solution.

Moniliasis—Monilia occur as small oval 2-4 μ budding thin-walled yeast-like cells. Occasionally mycelia may be present. The characteristic monilia bodies may be present. These are long rod-shaped bodies, the ends of which stain deeply.

Cryptococcosis—They appear in the sputum as an ovoid to spherical single budding thick-walled yeast-like organism 5-20 μ in diameter which is surrounded by a wide refractile gelatinous capsule. There are no endospores and no mycelia.

Actinomycosis—We may find the typical ray fungus granules in the sputum which under the microscope show the central filaments and the surrounding clubs. In the case of actinomycoses a direct study of the sputum yields a higher percentage of correct diagnosis than do the various cultural methods.

Blastomycosis—Blastomyces dermatitidis appear as oval or rounded doubly contoured refractile yeast-like cells which show budding. It produces a single bud so that the cells appear in pairs only, one cell of the pair being smaller than the other. There are no endospores and no mycelium.

Coccidioidomycosis—Coccidioides immitis appear as spherical bodies about 30 μ in diameter with a highly refractile double contoured cell-wall enclosing many small endospores. It never shows any budding by hyphæ formation in the sputum.

Histoplasmosis—The Histoplasma capsulatum are seen in the sputum as small oval capsulated yeast, usually intracellular measuring 3·5 to 5·0 μ in its longer diameter.

Aspergillosis—Aspergillus fumigatus is readily identified by its characteristic appearance. It consists of a stem and a stalk with a spore-bearing head.

Geotrichum—Geotrichum appears in the sputum as oblong or rectangular rods or as large spherical cells 4-10 μ in diameter. Both the forms may be present together.

CULTURE OF SPUTUM: The sputum should be collected in a sterile petri dish. The patient should be made to clean his mouth and throat thoroughly before spitting in the petri dish so that any saprophytic fungi that may be present may be washed off. The sputum should be cultured as soon after collection as possible. Sabouraud's medium is the medium of choice. Inoculations should be made in two flat screw capped bottles and one grown at 37°C and the other at 22°C. All fungi grow aerobically except the Actinomyces bovis. Actinomyces bovis is anaerobic and requires a rich medium. On veal infusion shake culture or Brewer's thioglycolate medium, usually pure cultures are yielded in 4-6 days provided the original material was not contaminated heavily. All the yeast-like and mold-like fungi and even nocardia grow readily on Sabouraud's glucose agar and standard blood agar media both at room temperature and at 37°C. Such fungi as Candida albicans, Aspergillus and Geotrichum develop well-defined colonies in 2-4 days. The other fungi may require 10-20 days to produce recognisable colonies. Consequently all inoculated media should be examined periodically for at least 30 days before being discarded. The colony and morphological characters of the various fungi infecting lungs, on Sabouraud's medium at 22°C are given below. At 37°C, the yeast-like phase predominates.

Candida albicans—The growth becomes evident in 4-5 days as creamy medium-sized moist to dull appearing colonies. The culture have a distinct yeasty odour.

The surface growth is composed of oval budding cells 2·5 × 4 to 6 μ, while the submerged growth is composed of pseudomycelium.

Cryptococcus neoformans—The colony is glistening mucoid in character and tan to brown in colour. Microscopically we find thick-walled ovoid to spherical budding cells 5-15 μ in diameter surrounded by a thick white gelatinous capsule. No endospores are produced and no mycelium is developed.

Actinomyces bovis—The colonies may be rough or smooth. They are about 2 mm. in diameter and are opaque white or greyish, raised matt with irregular outline. The rough colonies are rather heaped up.

Microscopically the culture shows chiefly rods 3·4 μ × 0·6 μ with clubbed ends. Careful search however will show a few definite filaments which may show the branching.

Nocardia asteroides—The colony appears as a central raised knob-like portion and an effuse ground glass periphery. The growth appears within 26 hours. Under the microscope the culture shows long branching filaments. later these filaments undergo segmentations and break up into rod forms of varying length and oval coccoid bodies.

Blastomyces dermatitidis—The fungus grows slowly and develops wrinkled waxy colonies. The mycelial phase of the fungus predominates, finally developing a white cottony ærial growth which becomes tan to brown with age.

Microscopically the cultures at 37°C show the budding yeast-like cells identical with those seen in the sputum. The cultures at 22°C show numerous oval

to rounded conidia 3-4 μ in diameter, attached to the hyphæ near septation. In old cultures many chlamydo spores are developed with outer walls thickened to give unusual appearances.

Coccidioides immitis—The colony develops quickly with abundant ærial mycelium which is cottony and white at first, but may become powdery and buff to brown with age.

Microscopically the culture shows numerous arthrospores which appear as deeply staining rectangular structures 2 × 5 μ in size separated by clear spaces along the course of the hyphæ. In old cultures the hyphæ fragment freeing the arthrospores and the cultures become friable and powdery.

The tissue phase has rarely been observed in artificial cultures.

Histoplasma capsulatum—The colony is cottony and white at first but becomes buff to brown with age. Young cultures show branching septate hyphæ bearing small rounded spores on short pedicles. Older cultures contain large rounded thick-walled spores covered with finger-like projections. These chlamydospores are characteristic and diagnostic of Histoplasma capsulatum.

Aspergillus fumigatus—The colony is velvety or felted spreading, dark green, becoming almost black with age. The mycelia may be septate or non-septate and are greenish, greyish or almost black in colour, 2-3 μ in diameter. In young cultures the conidial apparatus of the aspergillus may be seen. It consists of stalk (the conidiophore) which ends in the vesicle, which bears a zone of primary sterigmata, which in turn bears the chain of conidia. In aspergillus all the condids grow at the same time and are of equal age.

In Penicillium they grow one by one and are at different stages of development, and unequal in size.

Geotrichum—Most of the growth occurs just below the surface of the agar, the surface growth consisting only of a central small colony. Surrounding the central portion is a marked wide zone of mycelium growing down into the agar. Microscopically these hyphæ are seen to segment into rectangular arthrospores which vary in size. Also there are seen many spherical cells 4-12 μ in diameter which are segmented from the hyphæ, but fail to remain rectangular. The rectangular cells usually germinate by a germ tube from one corner, a very characteristic finding in cultures of Geotrichum.

Cultures of Blastomyces dermatitidis when the fungus is first isolated often show segmentation of the hyphæ into oblong geotrichum-like spores, but these cultures eventually become filamentous (mold-like) and produce conidia in contrast to Geotrichum, which remains soft and yeast-like and continues to produce arthrospores by fragmentation.

ANIMAL INOCULATION: The animals used are (1) Rabbit and (2) Guineapigs and/or mice.

In the case of Monilia rabbits are injected intracutaneously with the material from lesions and intravenously with a saline suspension of cultures.

In the case of Coccidiodomycosis the infective material is injected into the testes of guinea pigs, resulting in the development of severe orchitis. Cultures may also be injected similarly. In the case of all other infections the material or the culture is injected intraperitoneally either into the guinea pigs or mice. The infective organism are then isolated from the lesions produced in the animals and identified in the usual way.

BIOPSY: Biopsy examinations will be possible only in those cases where there is a skin lesion as well from which biopsy material may be taken. With the exception of the sporotrichosis the characteristic tissue form of the specific fungus can usually be seen in properly prepared sections of biopsy materials. The tissue form of the Sporotrichum schenckii, however, is rarely seen in sections and it is essential therefore that cultures as well as sections be made from each biopsy.

II. SEROLOGICAL TESTS

(*a*) SKIN TESTS: Skin tests are of definite but limited value in the diagnosis of mycotic infections. Antigens comparable to tuberculin have been prepared from cultures of C. immitis, H. capsulatum and B. dermatitidis. Heat-killed vaccines can be prepared in the laboratory for all the types of fungi that infect the lungs.

Clinical and subclinical infections with C. immitis and H. capsulatum regularly induce a tuberculin-like sensitivity to coccidioidin and histoplasmin respectively. Hence a negative skin test eliminates the possibility of these mycoses unless the patient has a progressive terminal infection. Infections with B. dermatitidis may or may not induce sensitivity, therefore, a negative reaction to blastomycin cannot be used to eliminate the possibility of this disease. Hypersensitivity to autogenous vaccines has been observed in most of the other mycoses, but there are insufficient data to evaluate their frequency and significance.

Apparently there is a small amount of antigen common to C. immitis, B. capsulatum and B. dermatitidis, since highly sensitized guinea pigs give cross reactions when tested with concentrated antigens. Such reactions, however, become relatively if not absolutely specific, when more dilute antigens are used for the skin tests. In doses commonly used for skin tests in man, persons with positive reactions to coccodioidin do give cross reactions with histoplasmin or blastomycin. There seems to be a large amount of this hypothetic common antigen in B. dermatitidis and H. capsulatum as subjects with clinical and sub-clinical infections with H. capsulatum usually react both to histoplasmin and blastomycin. In our experience, however, the size of

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the reaction to blastomycin is always smaller and disappears when more dilute antigens are used for the tests. As a practical procedure, therefore, histoplasmin, blastomycin and coccidioidin should be used simultaneously to determine, which gives the greatest reaction.

(*b*) COMPLEMENT FIXATION: Complement-fixing antibodies probably appear in most mycoses, if the infection is severe enough to stimulate a sufficient number of reaction cells. In subclinical coccidioidomycosis and histoplasmosis, instances of mild primary clinical coccidioidomycosis and in many cases of blastomycosis, the infection does not stimulate the production of complement fixing antibodies in detectable amounts. However, in the progressive form of these three mycoses, complement fixing antibodies are present regularly and persist even when the patient becomes anergic and the skin test is negative.

Cross complement fixation has not been observed between patients having coccidioidomycosis and histoplasmosis. However, most patients who fix complement in a high titre with histoplasmin also fix complement but to a lower titre with blastomycin. This necessitates simultaneous tests with blastomycin and histoplasmin. Some patients with histoplasmosis have higher complement fixing titres for blastomycin than other patients with a true blastomycotic infection. A limited number of observations suggest that B. dermatitidis is not as good an antigen as H. capsulatum and that patients with blastomycosis usually have negative or insignificant titres with histoplasmin.

The importance of the laboratory diagnosis of mycotic infections lies in the fact that many systematic mycoses occur which are clinically and pathologically similar to tuberculosis and that they may produce changes in the lungs ranging from bronchitis to massive pleuro-pneumonic lesions which resemble tuberculosis radiologically and can only be differentiated from it by exhaustive bacteriological and mycological study and we would be acting rather wisely if we suspect mycotic infection in every patient with a chronic cough and irregular fever, specially in the presumptive case of tuberculosis with a negative sputum.*

II

BINOCULAR SINGLE VISION AND ORTHOPTICS

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Binocular vision is the coordinated employment of the two eyes in order to produce a single mental impression in an individual. It is a characteristic of the primates and has been of tremendous importance in their evolution, in fact it has been the chief whip by which man assumed control over his environment more than any other creature.

In binocular vision there are two stages:—

(1) The presentation of two suitable uniocular sensations.

(2) The collaboration of these into a unitary percept.

The first is achieved by the two eyes and its each component part by bringing into alignment the visual axis to the object of perception and the second by fusion of these impressions in the different strata of the lines of Gennari in grey matter of the brain in occipital region and necessitates the overlapping of the fields of vision so that the same object can be seen by each eye and the central nervous system is so arranged that the sensations of one eye can be associated with the other.

In lower animals the binocular field is very small and as the eyes have gone from lateral to frontal position during gradual evolution the binocular field has increased and has been achieved highest in the human beings. In the lower types the vision is panoramic and the animal has the advantage of very much wider field of vision, in fact the whole of surrounding space is visible, with a little overlapping in front and behind in some cases.

Man has sacrificed the extent of his visual field and has a large blind area behind his head but he has gained a new important faculty of depth perception scientifically called stereoscopic (binocular) vision.

Now two adequate harmonious uniocular stimuli must fall on functionally related points on the retina of the two eyes known as corresponding points. Of course the nasal periphery of each retina has no corresponding points. When two images of an object fall on corresponding retinal points binocular vision is possible when they do not cause diplopia.

The correspondence of retinal points is not altogether an anatomical peculiarity because some cases of squints who get a low grade of binocular vision, the fovea of the fixing eye corresponding with the peripheral point of the squinting eye, we call such conditions as abnormal retinal correspondence.

Further experience has revealed that patients after operation for a squint, continue to use the false macula, and they are annoyed by the resultant double vision. To avoid the diplopia, the patient again produces a squint and reestablishes the association between the false and the true maculæ. Correspondence is then essentially a functional attribute capable of development and alteration and it is here that orthoptics steps in and the latest instruments now devised, like a synoptophore helps us not only in the treatment of such a squint but also in measuring the extent of the defect. Such a treatment obviously deals with defective habits of seeing, defects of binocular vision and defects of ocular motility. How perfectly adapted it is to deal with many of these defects will become apparent when the nature of the defect is made clear and scrutinised.

*Read before I Rajputana Medical Conference.

Orthoptic treatment then is the art of teaching patients, children or adults, how to use their eyes properly. At birth the eyes including the nervous pathways involved in vision are very imperfectly developed. As they grow anatomically they also develop physiologically. Some of this development is dependent on usage. Development may not progress in the normal or ideal way, obstacles may turn the course of development into wrong channels, resulting in different types of muscle imbalances and defective binocular vision. Skilful and understanding guidance by the orthoptic technician can lead the patient to better and more normal useful habits of seeing. Thus the aim of orthoptic technician is not the strengthening of some muscle or a group of muscles alleged to be weak but is directed towards teaching the patient better control and coordination, better reflex response to his environments, the technician is greatly aided by the physiology of vision and the psychology of teaching and learning.

Glasses may help greatly, may be indispensable in some cases but some can be taught also to use their eyes without glasses.

Operations often save much time and indeed make some cases amenable to orthoptics which otherwise would be hopeless without surgery. Thus refraction, orthoptics and surgery should always work together.

SELECTION OF CASES: It is very important in orthoptics that proper cases should be selected for such treatment. For instance, the following type of cases will not be suituble and are therefore always excluded from such a treatment.

1. Children with constitutional diseases such as epilepsy, mental disorder.

2. Paralysis of muscles unless the paresis is of a small degree or of recent traumatic origin.

3. Squint due to defect in media.

4. Squint due to retinal diseases.

LENGTH OF TREATMENT: It depends on—

1. *Type of a squint*—A squint of recent origin and not of paralytic type has a good prognosis and needs shorter treatment.

Accommodative squints have a better prognosis and take less time to cure.

Squints since birth are difficult to treat.

Amblyopias and strong family history seldom yield good results.

2. *Frequency of visits*—A biweekly visit on an average is good and each individual sitting should not be more than half an hour preferably a 15 minutes' training is fairly good.

3. *Intelligence of the patient*—A patient of good intelligence and cooperation is always very essential and as such go a long way to yield a good result.

4. *Efficiency of Orthoptist*—It is very important that the orthoptist should be well up in his subject and patient with his treatment. Slow progress and early failure should not disappoint him and he should never tire out his patient but should keep on going in such a way that the interest of the patient is kept and he cooperates with him. If in 6 weeks no improvement results by orthoptic treatment it should be given up and appropriate surgery should be resorted to. The best results in shortest time are achieved when orthoptic exercises are combined with surgery in a scientific way.

SYNOPTOPHORE: It is an instrument for diagnosing strabismus and for testing it by orthoptic methods. It also helps to find out in measuring the angle of deviation both subjectively and objectively; to find the presence of simultaneous perception, fusion and stereopsis.

HISTORY: A routine systematic examination of a case is very important and a special stress should be laid down to find out—

The age of onset of a squint, whether it is constant or periodic, unilateral or alternating, if there is a family history, the history of trauma or infection, the determination of the pupillary reactions, detailed examination of ocular media and fundi, the vision and ocular movements in each eye separately. The cover test for near and distant vision, a candle test and a test on orthoptic instruments—the usual ones being (*a*) Worth's light, (*b*) Maddox rod, (*c*) Maddox wing, and (*d*) Synoptophore.

OPTICAL CORRECTION: It is very important and accommodative squint responds very well when such a patient is fitted with proper glasses. As a curative measure a concomitant convergent squint with hypermetropia should always be little over-corrected.

A divergent myopic squint when fitted with proper glasses gives better convergence.

All astigmatism must always be corrected.

OCCLUSION: Occlusion of a good eye is a very useful step in early stages to stimulate the other eye to see, besides that, it reduces the angle of squint, increases the visual acuity, establishes an abnormal retinal correspondence, and in some cases it helps to establish fusion.

Occlusion is contraindicted (*a*) In presence of organic defect in the eye, (*b*) when there is eccentric fixation, (*c*) when there is loss of central fixation *i.e.*, the squinting eye has a vision less than 6/60.

A training in orthoptic exercises aims in achieving normal correspondence, fusion, stereoscopic vision and these exercises may be given in any of the three stages —as a preoperative, therapeutic and curative and postoperative measure.

CASE NOTES

CONGENITAL ABSENCE OF VAGINA TREATED BY ABDOMINOPERINEAL OPERATION

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Congenital absence of vagina is very rare. It has been estimated to occur once in 5,000 cases. Hence the following report of two cases with the technique of operation employed may be of some interest.

Case 1—Aolo, aged 20 years, was admitted on 20-9-49 with the complaint that she had never menstruated in her life.

Physical Examination—A good feminine physique with fully developed breasts and secondary sex characteristics. Pulse rate 82 p.m. Urine normal on examination. Perineal examination showed no vaginal opening. Blood pressure 118/80 mm. of Hg. Blood count was normal.

Case 2—Zetun , aged 18 years, seen at Surgical Camp at Sikar in September, 1949.

The patient's complaints were non-appearance of menstruation, difficulty in coitus and occasional pain in the lower abdomen after intercourse. The husband complained that there was no penetration and he felt a good deal of resistance during coitus which could not be overcome.

Physical examination:—A good feminine physique with fully developed breasts and secondary sex characteristics. She apparently had all the signs of puberty. The uterus could not be felt bimanually. Pulse rate 76 p.m. Blood pressure 120/74 mm. of Hg. Blood examination could not be done in the camp, but clinically she had no anæmia.

Perineal examination showed absence of vaginal opening.

It is important to differentiate the condition from imperforated hymen. In the latter case there is fullness at the site of the vagina with fluctuation over the swelling. An exploratory puncture clears the diagnosis.

Operation

Preparation—The abdominal wall and the perineum were prepared for the operation.

A preliminary injection of morphine grain 1/6 and atropine grain 1/100 was given before the operation.

The operation on the perineum was done under local anæsthesia. The operation on the abdomen was done under ether anæsthesia.

Perineal Operation—An oval-shaped incision was given in the space between the labia on either side of the urethra anteriorly, and anus posteriorly. The oval flap of skin was removed. The wound was deepened by cutting through the connective tissue in the depth of the wound upto the peritoneum of the pouch of Douglas. It was also widened laterally, anteriorly and posteriorly. In this manner a good wide space was created approximate to the normal vaginal space. It is preferable to have as broad and wide space as feasible, rather than too narrow a space which might contract later on and spoil the effect of the operation. At this stage the abdominal operation is started and the perineal wound is packed and covered with sterilized dressings.

Abdominal Operation—The abdomen was opened by a median incision extending from the symphysis pubis to the umblicus. At the lower angle, the peritoneum was temporarily sutured to the skin to keep the bladder away from the field of operation.

A loop of ileum about 20-30 cm. from the ileocæcal junction was taken. It should be assured that this loop, meant for construction of vagina, reaches the floor of the pelvis without tension and lies loosely.

A U-shaped loop of ileum was separated from the main gut. Each end of the loop was compressed by clamp, closed with silk ligature, and then buried by purse-string sutures and few interrupted silk sutures. Similarly the two free ends of the ileum were closed and a side to side isoperistaltic anastamosis was performed between the two limbs of the ileum. The continuity of the gut was thereby re-established.

The usual technique of side to side anastomosis was employed.

The two limbs of the U-shaped loop of ileum were stitched together along the anti-mesenteric borders including the muscularis in the sutures. This is done with a view to avoid coils of small intestine being caught within this loop and thus get strangulated, and also to prevent the pull of one limb on the other.

At ths stage the assistant pushes a clamp through the perineal wound towards the pouch of Douglas. The tip of the clamp is felt through the abdominal cavity and its direction was guided to appear just at the centre of the space between the bladder and the rectum. The peritoneum of the pouch of Douglas was opened over the clamp. The assistant opened the clamp, thus enlarging the opening in the peritoneum assuring easy exit of the U-shaped loop through it without compression. The convex top of the U-shaped loop was held in the clamp and pulled out into the perineal wound till it reached the skin margins of the wound without any tension or pull on it lying loosely in the wound and allowing for future shrinkage.

The peritoneum of the pouch of Douglas was sutured by interrupted sutures around the base of the loop.

The abdominal wound was closed and dressed. Then returning to the perineal field, the U-shaped loop was opened at its convex top and the mucous secretion wiped off. The intestinal loop was stitched to the skin, posteriorly and on either side of the perineal wound, and anteriorly with the mucous membrane below the urethral opening. In this manner a good spacious canal of mucous membrane was formed to take the place of the natural vagina.

The wound was dressed and the stitches removed on the 10th day. A few stitches on the perineal site gave way but the wound healed quite normally otherwise.

Operative Findings—The uterus was absent in both the cases. Both the ovaries were present and normal in size.

Results

The patients were examined about two months after the operation. The artificial vagina was found quite satisfactory. There was no constriction. The union was firm. The division of the median septum in between the two limbs of the U-shaped loop was not required. A long clamp was used to hold the septum pressed firmly and left for about 5 days. It was cut through the septum and was then removed. The remaining portion of the septum was found to shrink upwards and a wide canal was left.

Discussion

To all intents and purpose, these two ladies were normal. As both the ovaries were present, the secondary sex characters developed normally. But the history of non-appearance of menstruation was typical. As already indicated, chief importance of the condition lies in the differential diagnosis of the condition from imperforate hymen. If the condition is discovered before puberty the treatment should always be expectant as harm may be done if haphazard attempts are made to involve the vaginal region. The bladder or the rectum might be injured. Where opportunities are available a rectal examination with peritoneoscopy might help in the diagnosis. In these two cases the diagnosis was made correctly clinically and a reconstruction of vagina was decided upon so that normal sexual relationship becomes possible. It was found during operation that the uterus was non-existent in both the patients and this is the most common finding in these cases.

If a vaginal pit of any dimension exists, it can be enlarged with incision and blunt dissection and suppositories of œstrogenic hormone may be used with benefit. Otherwise the operative procedure described above is to be resorted to.

IDIOPATHIC SPONTANEOUS HYPOGLYCAEMIA

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AND
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C. K. Hindu male, aged 55 years, labourer by occupation, had irregular remittent fever for 4 or 5 days, for which he was treated in the outdoor department with quinine and diaphoretic mixture. But as he showed considerable prostration and asthenia he was admitted on 27-7-50.

His past history was not very significant. He never had any fits or any major illness.

On examination—He was a dark coloured, ill-nourished, thinly built individual. He was conscious but drowsy, and answered to questions coherently but was sluggish in speech and movement. His eyes were muddy coloured. No cyanosis or jaundice; no glands; no œdema; no clubbing of fingers. Tongue was moist and coated. Teeth and gums unhealthy. Temperature —99·6°F. P/R—88/20. Blood pressure—85/65 mm. of Hg.

Nothing abnormal could be detected on examination of the heart or lungs. Abdomen—soft, no tenderness anywhere and no masses. Liver and spleen not palpable.

Blood count: Hb—90 per cent (Sahli), W.B.C.—9,700 per c.mm.; neutrophils—80 per cent, lymphocytes—20 per cent, monocytes—0, eosinophils—0, malaria parasites—nil.

Urine and stool examination did not reveal any abnormality.

He was put on diaphoretic mixture, paludrine tablets and glucose drinks. The temperature subsided in two days but he continued to show considerable asthenia mentally and physically.

Blood chemistry was, therefore, done and the results were:—

Blood sugar—40 mgm. per 100 c.c.; Blood chloride—417 mgm. per 100 c.c.; Blood urea—72 mgm. per 100 c.c.; Blood NPN—55 mgm. per 100 c.c.; Blood cholesterol—125 mgm. per 100 c.c.

Blood sugar estimation was repeated and was found to be 42 mgm. per 100 c.c. (fasting morning sample). Repeated 3 days later it was again 45 mgm. per 100 c.c. He was then enjoying full diet with 1 seer of extra milk and two oranges and was allowed to move about as he pleased. His asthenia gradually improved and he moved about more freely. His blood pressure rose to 110/75 mm. of Hg. in about a week and was maintained at that level.

After about 10 days the blood examination was repeated:

Blood sugar—50 mgm. per 100 c.c.; Blood urea—40 mgm. per 100 c.c.; Blood chloride—460 mgm. per 100 c.c.; Van den Bergh reaction—Negative; Prothrombin time—36 secs.

Glucose tolerance test—Blood sugar: fasting—37 mgm. per 100 c.c. 50 gm. of glucose was given by mouth.

After ½ hour—65 mgm. per 100 c.c.; After 1 hour—115 mgm. per 100 c.c.; After 1½ hours—136 mgm. per 100 c.c.; After 2 hours—120 mgm. per 100 c.c.

Urine samples collected during the test period did not show any sugar.

The effect of starvation on blood sugar and appearance of hypoglycæmic symptoms were studied. The patient was starved for 24 hours and was closely watched for possible symptoms of hypoglycæmia. Blood for sugar estimation was collected at intervals. No symptoms of any importance appeared. Patient did ask for food but did not complain much when he was refused. There was no abnormal behaviour and he was able to move about even after 24 hours' starvation.

Blood sugar during starvation period:

After 12 hours—45 mgm. per 100 c.c.; After 17 hours—42 mgm. per 100 c.c.; After 20 hours—37 mgm. per 100 c.c.; After 24 hours—37 mgm. per 100 c.c.

Discussion

Himsworth classifies causes of spontaneous hypoglycæmia as follows:

1. Known causes of hypoglycæmia—

(A) Excessive removal of sugar from blood—(*i*) Excessive exercise and (*ii*) Low renal threshold for glucose.

(B) Diseases of the liver—(*i*) Acute necrosis, (*ii*) Certain cases of chronic inflammation, (*iii*) Widespread secondary carcinoma and (*iv*) Von Gierke's disease.

(C) Disorders of endocrine glands—(*i*) Hyperinsulinism: (*a*) Islet-cell tumour and (*b*) Hyperplasia of the islet cells (?) (*ii*) Hypopituitarism and (*iii*) Addison's disease.

II. Idiopathic (or "Nervous") spontaneous hypoglycæmia.

In hypoglycæmia due to known causes the primary condition can usually be diagnosed easily.

In the diagnosis of the case under report, excessive removal of sugar from the blood could be easily excluded. In liver diseases hypoglycæmia may occur, but not before 80 per cent of the liver parenchyma has been destroyed. So that other symptoms and signs of extensive liver damage should also be present. Such symptoms were not present in the present case.

The dark colour of the patient, his asthenia and low blood pressure together with a somewhat lower blood chloride and high blood urea raised the suspicion of Addison's disease. The gradual improvement of the patient, rise of his blood pressure with rest and improved diet without any extra chlorides or substitution therapy were points against such a diagnosis. The elaborate Cutler's test could not, however, be done.

The main differential diagnosis lay between hyperinsulinism and idiopathic hypoglycæmia. In the latter condition symptoms of hypoglycæmia, specially hypoglycæmic convulsions do not occur. Mild or transient weakness or stupor may occur. Moreover in hyperinsulinism, there is a progressive fall of blood sugar level on fasting and hypoglycæmic symptoms appear rapidly so that the fast has to be terminated.

In the present case the patient did not have any symptoms of hypoglycæmia with the blood-sugar as low as 37 mgm. per 100 c.c. It appeared that he became used to a very low blood sugar level for a long time. With full diet, sweet drinks and intravenous glucose infusions twice daily, his morning fasting blood sugar could be raised to 50 mgm. per cent.

From these considerations it appears that the present case is one of idiopathic spontaneous hypoglycæmia. According to Himsworth, nearly half to two-thirds of the cases of hypoglycæmia fall under this group.

Acknowledgment

We acknowledge with grateful thanks our indebtedness to Major D. Lahiry, Pathologist, Calcutta Port Commissioners Hospital, for his kind help in conducting the biochemical and other laboratory investigations and to Dr. K. Bhadury, Chief Medical Officer, Calcutta Port Commissioners, for his kind permission to publish the records of the case.

Reference

Himsworth—*Medical Annual*, 1943, p. 171.

A CASE OF PERFORATED PEPTIC ULCER—SUCCESSFULLY TREATED WITHOUT OPERATION

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A Muslim male, aged 40 years, was admitted on 23-7-50 at about 9-30 P.M. with history of sudden attack of epigastric pain since midday.

No significant family history or personal history could be elicited and an indefinite history of acidity and pain in the epigastrium in the past was obtained.

The pain in the epigastrium was sudden in onset soon after midday. It radiated downwards and was continuous in nature. He did not take any food since early morning and took only a little water now and then. He had no vomiting and his bowels moved in the morning.

On Examination—The patient was of average build and nutrition. He was toxic and restless. There was no cyanosis, no jaundice and no glandular enlargement. Eyes were sunken. Tongue was dry and slightly coated. His temperature was 98·4°F, pulse 88 per minute, regular; respiration 28 per minute and B.P., 120/80 mm. Hg.

Abdomen was distended, the lower part appearing fuller than the upper part. There was very little movement of the upper part of abdomen with respiration. The whole of abdomen was markedly rigid with tenderness all over, which was, however, more marked in the epigastric area. No lump could be palpated. Spleen and liver could not be palpated due to rigidity of the abdominal wall. Shifting dullness could be elicited and the liver dullness started at the right 7th intercostal space anteriorly. Peristaltic sounds were not audible. Rectal examination showed fullness on the upper part of anterior rectal wall and tenderness on both sides. No other abnormality was detected in any other system.

Fluoroscopy showed a distinct layer of gas of about ¾th inch width, with fluid level under the right dome of the diaphragm.

Blood Examination—Hb.—65 per cent (Sahli); rbc—3·2 million per c.mm.; wbc—7,200 per c.mm., poly—74 per cent; lympho—24 per cent; mono—2 per cent; eosino—0 per cent; malarial parasites—none found.

Urine Examination—Nothing significant except a trace of albumen.

Stool Examination—Stool when first passed three days after admission in hospital, showed a strong reaction to tests for occult blood and no other abnormality.

Treatment

The patient and his relatives refused an operation and the treatment was carried out on conservative lines.

He was nursed in a propped up position. The stomach contents were emptied through a Ryle's tube; —a continuous gastric suction was maintained for four days. Later stomach contents were aspirated at regular intervals and aspiration was finally stopped after the 6th day.

Normal saline with 5 per cent glucose was given by the intravenous route continuously at the rate of 20-30 drops per minute.

Penicillin was given intramuscularly, 30,000 units every 3 hours till his general condition improved and the temperature which went up a few hours after admission came down to normal. One gm. of sulphathiazole sodium was given intravenously every 6 hours for 5 days.

General supportive treatment in the form of iron and vitamins was given as required in the later stages.

Feeds—No feeds by mouth were given till after 4 days in hospital. Intragastric drip feed was started on the 5th day at the rate of 10 to 20 drops per minute. Feeds were given for one hour and discontinued for the next hour alternately and stomach contents were aspirated out every 4 hours till the 6th day in hospital, when the aspiration was stopped . A solution of protein hydrolysate (1 oz. to a pint) in 5 per cent glucose solution in normal saline was used for the purpose of feeds during the first three days. Then milk was given during day time and protein hydrolysate solution at night.

Feeds by mouth were started after about two weeks in hospital. Milk, egg-flip and protein hydrolysate solution were used alternately, 4 oz. at a time every 2 hours for one week. Then a course of modified Sippy treatment was given without any antacids, as his aspirated gastric contents contained very little free hydrochloric acid.

Progress of the Case

The patient started having a high fever within a few hours after admission and the febrile state with toxæmia continued for eight days. It settled down gradually to normal and he was afebrile after the 10th day.

Rigidity of the abdominal wall persisted for 3-4 days after which it disappeared gradually. Peristaltic sounds were audible after the 2nd day. After five days in hospital the patient started having 3 to 4 loose stools per day and the condition improved in about 3 days without any specific treatment and nothing significant was found on examination of stool and examination per rectum again.

No lump was ever palpable even after the rigidity had subsided. Tenderness also gradually diminished in intensity until there was none after about 10 or 12 days.

Subsequent recovery was uneventful and the patient was discharged after about a month's stay in hospital. He was instructed regarding his diet and medicines, and was again examined after about two months. He was found in a good general condition of health and his hæmoglobin was 80 per cent (Sahli). He had been free from any abdominal discomfort. Abdomen was soft and no lump and tender area could be palpated.

Discussion

Conservative treatment of perforation of peptic ulcers is at present a recognised form of treatment and is specially indicated in cases where large feeds or drinks have not been taken immediately before or after the perforation. Taylor (1946) treated 28 consecutive cases of perforated peptic ulcer without operation and 24 survived. Visick (1946) reported 3 deaths in 14 cases of perforated peptic ulcers treated without operation. The line of treatment was more or less as in the case reported. Simultaneous streptomycin and penicillin administration are advocated in large doses in these cases as the bacteria involved are usually susceptible to these but in this case as streptomycin was not available sulphathiazole was used with good result. Conservative treatment is absolutely a different trend in the treatment of perforated peptic ulcer and is worthy of more extensive trial in our country where the people have got an inherent dread for operation, and where facilities for emergency abdominal operations are obtainable only in big cities.

Summary

A case of perforated peptic ulcer is described.

The patient was successfully treated on conservative line with continuous gastric suction to prevent further leakage, fluids by the intravenous route to prevent dehydration, and penicillin and sulphathiazole parenterally to combat sepsis.

Acknowledgment

I am grateful to Dr. K. Bhaduri, Chief Medical Officer, for his guidance and permission to publish the report.

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SPONTANEOUS HYPOGLYCÆMIA

Spontaneous hypoglycæmia as a clinical entity was first described by Harris[1] and subsequently supported by Wilder.[2] Conn[3] considered that an alteration of psychical functions followed by profuse perspiration and in severe cases a gradually developing coma and convulsions, brought on spontaneously without the administration of insulin, to be diagnostic of spontaneous hypoglycæmia, provided the symptoms were relieved by glucose administered either by the alimentary or the intravenous route. He classifies the causes into three groups : organic, functional, miscellaneous. Amongst the last group he mentions starvation as one of the causes. Hartmann[4] classifies hypoglycæmia as true hyperinsulism, relative hyperinsulism and cryptogenic. Himsworth[5] calls the last group as idiopathic, as no cause can be ascertained by ordinary methods.

The importance of the recognition of hypoglycæmia lies in the differential diagnosis. An accurate diagnosis is necessary before adequate treatment can be instituted. An epileptic requires a sedative but an hypoglycæmic requires glucose for symptomatic relief. The diagnosis of organic hypoglycæmia is based upon a low blood sugar level specially if it remains below 50 mgm., severe neurological or psychiatric disturbances associated with hypoglycæmia and relieved by intravenous glucose, and negatively by the exclusion of hepatic, adrenal and pituitary insufficiency and of primary neurological lesions. In these cases the patient requires a surgical operation, as most of them are cases of pancreatic tumour.

Mazumdar and Mukherji[6] describe in this issue of the journal three cases of starvation where spontaneous hypoglycæmia developed in the course of nutritional oedema. The basic lesion in these cases probably lies in the liver as postmortem reports of starvation cases show an unusual amount of fat in the liver with consequent depletion of glycogen. Hypoglycæmic syndrome in starvation may not be a very usual occurrence as shown by Chakravarty[7] who reported on a study of blood sugar levels in 407 cases of evacuees from Burma. He found that 59·1 per cent of his cases had blood sugar level below 80 mgm. per cent and one of them had as low a level as 19·2 mgm. per cent. It is curious that none of his patients developed any symptom of hypoglycæmia. It is a well known fact that the critical level of blood sugar varies from person to person and it is not rare to find hypoglycæmic symptoms in diabetic patients when blood sugar level remains as high as 150 mgm. per cent. In normal persons, however, hypoglycæmic symptoms may be ushered in at a blood sugar level of 75 mgm. per cent but in certain persons no manifestation is seen till it reaches a very low level, *e.g.*, 30 mgm. per cent (Wright).[8] The factors responsible for this variance from man to man are not definitely known. Whether the brain becomes acclimatised to unusually low blood sugar level if it sets in gradually or whether some other unknown mechanism is at work is not definitely known. The recent studies on electroencephalography may throw some light on the problem and there is a possibility that a large number of people with tendency to hypoglycæmic coma with comparatively moderate blood sugar level may have high convulsion threshold. Without further work it is not possible to dogmatise, but it is worth noting that cases of nutritional œdema may develop hypoglycæmic symptoms and one should guard against such an accident, by ensuring high carbohydrate and high protein diet and by recognising the earliest symptoms and instituting proper treatment promptly.

The case report by Chatterjee and Basu Roy[9], published also in this issue is very interesting. As no cause could be found they, according to the terminology of Himsworth, called the case as one of idiopathic spontaneous hypoglycæmia.

Recognition of these cases is important as quite a number of them are liable to be treated wrongly as cases of epilepsy and some of them may die before the condition is actually diagnosed.

HEALTH PLANNING

The Government of India have appointed a Planning Commission to advise them on introduction of measures to improve industry, agriculture and cognate subjects so that the social and economic regeneration of our people can be achieved without much loss of time.

The Commission has commenced its labours in right earnest. We are glad to learn that a medical panel has been appointed to advise on the general pattern of health development with schemes for priority for each of them, co-ordination between the Centre and States on health schemes and their reorientation. We are happy to learn that the Vice-Chairman of the Committee Sri Nanda spoke in a serious vein and depicted the true picture of the health conditions and sought advice of the panel on them. The panel has divided itself into as many as eleven sub-committees to explore the problems of education and research, position of different systems of medicine, moral health, preventable diseases, maternal and child health, industrial health, manufacture of drugs and equipments, growth of population and needs of family planning. All these subjects are entrusted to different sub-committees for their considered views to enable the Planning Commission to proceed ahead to lift our people from the present rut they are plunged in.

[1] Harris, S.—*J.A.M.A.*, **83** : 729, 1924.
[2] Wilder, R. M. *et al*—*Ibid*, **89** : 348, 1927.
[3] Conn, J. W.—*Ibid*, **115** : 1669, 1940.
[4] Hartmann, A.—Brennemann's Practice of Pediatrics, Volume 1.
[5] Himsworth, H.P.—Medical Annual, 1943. p. 171 John Wright & Sons, Ltd. Bristol, England.
[6] Mazumdar, D. C. and Mukherji, K. L.—*J. Indian M. Assn.*, **20**:361, 1951.
[7] Chakravarty, M.—*Lancet*, **1**:596, 1948.
[8] Wright, S.—Applied Physiology, 8th Edition, Oxford University Press.
[9] Chatterjee, P. K. and Basu Roy, B.—*J. Indian M. A.*, **20**:374, 1951.

The Commission has thus taken a very realistic view regarding the growing deterioration of the national health of our country. Positive health is a definite asset to any country and ours being mainly an agricultural country where the average people are steeped in ignorance, illiteracy and abject poverty, it needs special care and attention from the Government as well as leaders of public opinion. To cope with the persistent deficit in the food requirements of our country, our man-power amongst the masses has got to be revitalised so that the latent energies in our people may be utilised in fighting the food front effectively by producing more. Although this is a colossal problem, we have to strive to achieve it. Preventable diseases like Malaria, Cholera, Small pox and Tuberculosis have got to be controlled by the modern scientific methods and in this endeavour co-operation of all is indispensable.

The Government have already got enough materials from the reports of the Health Survey and Development Committee appointed by the previous Government of India. The mine of information contained therein and the recommendations if given effect to, will, we are confident, usher in a new era so far as solving the medical and public health needs are concerned. We feel that no fresh materials or schemes are called for, but what is needed is provision of funds to implement the recommendations of the Health Survey Committee.

Our Health Minister at the Centre spoke to the members of the medical panel of the Commission that paucity of funds is the greatest handicap in proceeding further to achieve the objectives. She suggested two methods—one is to introduce health stamp as had been done in some countries of the West to raise funds, and the other is to introduce a national health insurance scheme.

For our country, we feel that the former will not be very successful but the latter alternative is expected to yield a better result. In this connection, our expectations about the modified Industrial Health Insurance Scheme being put into practice, as enunciated by the Government some time ago, have not yet fully materialised. We expected that this scheme, if worked out, might open out avenues for its furtherance in wider fields.

It is true that because of the slender resources of the Central and Provincial Governments, particularly when they are faced with many strategic and complicated problems of food and defence, the attention which the problem of health needs could not be ensured. We are aware that our Governments since the achievement of independence have increased expenses under Medical Relief and Public Health to a great extent, but placed as our people are after centuries of neglect, these added expenses are not at all sufficient to cope with the situation.

Let us hope that the labours of these sub-committees will be productive of sound schemes and not much time will further be lost in giving effect to the same so that we can reach our objective of ensuring positive health for the masses of our country. We wish the Panel Committee and the Planning Commission all success in their efforts in the regeneration of our national health.

OBITUARY

The death occurred on 15th March, 1951 at Katrasgarh of Dr. Akhil Nath Sarkar of Bihar at the age of 64. Dr. Sarkar, the youngest brother of the reputed scholar and historian, Sir Jadunath Sarkar, was born in 1887 at Rajshahi, Bengal. He graduated in medicine from the Medical College, Calcutta, in 1911, and two years later joined the Bihar Medical Service. In 1926 he became a lecturer in Obstetrics and Gynæcology at the Prince of Wales Medical College, Patna, where subsequently he became a professor.

Late Dr. Akhil Nath Sarkar

An honorary member of the Royal College of Obstericians and Gynæcologists (England) and a Rai Bahadur, Dr. Sarkar was also a 'live' figure among those who were at the helm of the I.M.A. activities in Bihar. His election to the Presidentship of the Bihar Provincial Medical Association for two consecutive years (1946-48) testifies to the high esteem he was held in and the popularity he had won among his fellow medicos. His untiring services in the cause of public health is now a by-word in Bihar and the medical profession will never forget how he in his presidential address at the Patna Conference in 1947 referred very determinedly to "our battle against squalor, disease and premature death" and "our dream of a happy, prosperous and healthy India".

A rare combination of strict discipline and sweet amiability, Dr. A. N. Sarkar's death is a blow to the I.M.A. and a loss to the medical profession as a whole.

We offer our condolence to the bereaved family and pray for peace to the departed soul.

CURRENT TOPICS

MALARIA CHEMOTHERAPY COMMITTEE'S OPINION ON ANTI-MALARIAL DRUGS

The following constitutes the summary of observations made by the Malaria Chemotherapy Committee of the Council of Scientific & Industrial Research:

1. (*a*) Even with the advent of synthetic drugs, Cinchona alkaloids still hold an important position. In view of the economical conditions and availability of large stock of these alkaloids in the country, the Committee recommends that greatest possible use of these alkaloids be made in the treatment of acute cases of malaria subject to the recommendation in para 3 hereunder in case of prophylactic treatment in malarious villages.

(*b*) With regard to the role of cinchona alkaloids and cinchona plantations in India, the Committee was of the opinion that the existing cinchona plantations in different parts of the country, particularly in Bengal and Madras, be maintained at least at the present level.

(*c*) Regarding synthetic drugs, the Malaria expert Committee of the World Health Organisation has stated that Chloroquin and Paludrine were drugs of choice. In view of the difficulties in foreign exchange and of the availability of large stock of Mepacrine in the country and its recognised therapeutic value, the Committee recommends that its use also should be made as much as possible in preference to paludrine and chloroquin.

2. The Committee is of the opinion that so far as cure of relapsing Benign Tertian Malaria is concerned, 8-amino-quinoline derivatives combined with quinine or mepacrine can be considered the best form of treatment and research should be directed towards the preparation of a compound with relatively lower toxicity.

The Committee is of the opinion that further work was necessary to determine the comparative dosage of different antimalarial drugs. In the meantime, the following dosages are provisionally recommended:

(*a*) *Quinine*: 15 grs. for 5 to 7 days. Total—75-105 grs. In severe cases, quinine may be given in larger doses 20-30 grs. in the first two days. In cases of emergency and when quinine is not tolerated orally, it may be given as an injection.

(*b*) *Mepacrine and Paludrine*: 0·6 gms. on the 1st day and 0·3 gms. for the next four days. Total—1·8 gms.

(*c*) **Chloroquin*: 1 gm. divided in two doses on the first day. 0·5 gm. daily on the succeeding three days. Total—2·5 gms.

In the treatment of malaria in malarious villages, paludrine when distributed through non-medical agency, a single administration of 300 mgm. may be found adequate. For prophylactic use, weekly dose of 0·3 gm. during the malaria season has been found useful.

*Not yet available in India commercially.

The relative cost of these drugs for one course of treatment will be as follows:

	Rs.	as.
Quinine (75-105 grs.) ..	—	6·85-9·6
Mepacrine (1·5-1·8 gms.)	—	2·76-3·312
Paludrine (1·8 gms.) ..	—	5·032
Chloroquin ..	2	5

INTERNATIONAL COLLEGE OF SURGEONS

The following are extracts from the Presidential address delivered by Dr. R. N. Cooper at the First Conference of the Indian Chapter of International College of Surgeons, held in Bombay on 29th September, 1950:—

The idea behind the International College of Surgeons is to have under its banner a group of men practising surgery in different parts of the world, bound by certain common professional and ethical standards. The aims and objects of the College are so laudable that it was but natural that about fifty surgeons from different parts of India met together in Delhi and founded the first Indian Chapter of the International College in 1947. With a view to obtain first-hand information of the working of the College, some of the founder members of the Chapter went over to the United States of America to attend the annual convention of the College that was held in Chicago in 1948. Contacts were thus established with some of the leading lights of the College.

India was the cradle of surgery and surgery of a high order was practised in this land of ours. Susruta's name is well-known to every student of history of medicine. Susruta taught surgery in Taxilla somewhere about 600 B.C. or earlier. Operations like rhinoplasty, cæsarian section, craniotomy, suprapubic lithotomy were practised and good descriptions of the operations are available in the Susruta Samhita. One hundred and one blunt surgical instruments and twenty kinds of sharp instruments have been described therein. But probably the genius of Susruta did not have the right kind of environment for its full development. Unfortunately for science, Indian thought has always leanings for matters spiritual. To my way of thinking this attitude of the Indian mind was detrimental to the development of surgery as a science.

There were other causes for the decline of Surgery which need not be elaborated. It is wrongly argued that the British are to blame for the decadence of Indian medicine and surgery. The decay started long before the British came to India and changed the course of its history. It is no doubt true, however, that what little surgery or pseudo-surgery survived through the passage of time was given the final coup de grace when Listerian principles were accepted in surgery and practised in the medical schools and hospitals established by the British. Surgery as practised in ancient India died long ago and was buried unhonoured and unsung. Now and again a student of medical history digs up some of the remnants which bear witness to the glory that is

gone. What is true of surgery is true of Indian medicine too, but to a much less extent. Surgery of ancient India is so dead that it cannot be revived even by the most enthusiastic nationalist who wants that we shall have nothing that savours of the West.

Modern medicine belongs to no country. It belongs to the world. It is the one unifying factor that makes human beings understand each other. It is the one ray of hope in this tired and wearied world torn by conflicts of ideals. Let modern medicine evolve in its own way. Let us not attach false values led away as we are by a sense of patriotism. It cannot be denied that we have every reason to be proud of our ancient medical literature. Some of the clinical observations mentioned therein are remarkably accurate.

But we must also admit that modern medicine which is the result of continuous accumulation and assimilation of new discoveries in various allied sciences has outstripped the indigenous system of medicine that remained static for over two thousand years. Let us face facts. There is nothing to be ashamed of in accepting the teachings of modern medicine which belong to no country or nationality. Let us not fritter away our energy, time and money in running after shadows and losing the substance. The best service that we can render to our ancient system of medicine is to create at least two chairs of research in every university for the study of the history of medicine and for the development of its materia medica. Let the research workers bring to light some striking discoveries from our ancient literature and these will be gratefully acknowledged the world over. The prestige of the Indian system of medicine will then be automatically enhanced.

This very Conference is a proof of the fact that medicine is universal. Distinguished disciples of medicine have travelled all the way from different parts of India and from U.S.A. to join us in our deliberations. As followers of medicine we have but one common ideal. We have to realise that we are citizens of the world first, and Indians or Americans afterwards. From this platform, through this august assembly, I wish to appeal to those who have the interest of medicine at heart, to register their protest against attempts to thwart its natural progress.

The institution in which this convention is being held was started about twenty-five years ago with the avowed object of breaking the monopoly of the I.M.S. and to create new ideals. With pardonable pride I may be permitted to say that this institution has played an important part in bringing about a definite change in the attitude of those who practise medicine. We are still on the first rung of the ladder which is both steep and high. Conferences of this nature are a great help in improving both professional and ethical standards. We hope to attract many eminent surgeons from different parts of the world in our future conferences. We need every possible encouragement from our own government. It is a matter of great encouragement that we have had the good fortune to have our Minister for Health Rajkumari Amrit Kaur to inaugurate the first conference.

NOTES AND NEWS

GLOSSARY OF INDIAN PHARMACOPŒIA UNDER COMPILATION

Valuable results have been obtained by research on medicinal plants carried on under the auspices of the Council of Scientific and Industrial Research.

A publication containing information on medicinal plants recognised in the British Pharmacopia and their substitutes growing in India is now under print. Three hundred plants of medicinal interest have been investigated and a glossary of Indian Pharmaceutical Plants is under compilation. Cultivation of belladona, hyoscyamus and digitalis is now being carried out on a large scale and experimental cultivation of various medicinal plants has been started. Alkaloids and active principles have been isolated from plants used in indigenous systems of medicine such as garlic, babchi seeds, bakayan fruits, chaksu seeds, chota chand, gandaru, gilo and scientific studies of them are proceeding.

The bitter constituents of Neem have been isolated and used in the preparation of ointments for skin affections and as a gargle for sore throat. Their use in the preparation of tinctures, medicinal cosmetics and tooth pastes have been investigated. Three active principles termed as bio-chamins have been isolated from *Kablichana* and have been found to have growth-promoting activity similar to vitamins.

An economic process has been developed for preparing pyrethrum extracts for use as insecticides. A biologically stable semi-varnishing type of mosquito repellant cream has also been prepared.

Methods have been worked out for the preparation of medicines such as adrenaline, pituitrin, thyroxin and insulin from the animal glands available in slaughter house wastes.

For co-ordinating malaria research in India, the Council has set up a Committee. Under the auspices of this Committee, a vigorous search for anti-malarials from indigenous raw materals is being made and Paludrine-like compounds and 8-amino quinolines are now being synthesised for pharmacological tests.

An Anti-biotic Research Centre has been opened at St. Xavier's College, Bombay, where active principles isolated from indigenous medicines are being examined for antibiotic activity. Experiments undertaken at this centre on a plant known as *Danshir (pristimera indica)* which grows in a state of nature along the Konkan coast show that the plant contains active principles of therapeutic value against pneumonia. A process has also been developed for the extraction of dulcitel, an expensive chemical from this plant.—*G. I. Press Release.*

PENICILLIN FACTORY IN INDIA

The Government have announced their decision to accept an international offer of assistance in setting up a penicillin factory in India at an estimated cost of Rs. 2 crores. The World Health Organisation under the terms of the offer, will make available technical assistance and training facilities for Indian personnel to an extent of $350,000 (Rs. 16,00,000 approxi-

mately), while UNICEF will pay for plant and machinery up to $850,000 (Rs. 4,00,000 approximately).

Against the latter sum, either the Government of India or the factory will have to make available to Indian women and children free supplies of penicillin to the total value of $850,000 over a period of 2 years. Further details concerning free supplies have to be agreed upon before the matter is finalised.

It is estimated that the factory will take 12 to 18 months to equip and get into production and that a minimum production of 400,000 mega units per month will be reached at the end of two years, rising ultimately to 700,000 mega units. WHO, under whose technical guidance the project is to have been launched, has given formal assurances that the penicillin produced by the processes recommended by WHO experts will be equal in quality and no more expensive to produce than what could be purchased from private commercial firms.

Under the proposed agreement, the Government of India will retain full control over the erection, operation and maintenance of the factory and of its staff. WHO and UNICEF will make available such technical assistance and guidance as is requested by the Government of India.

Questions regarding the site, etc. are under active consideration and detailed plans for setting up the factory will shortly be discussed with the experts of WHO.—*WHO Press Release.*

PEOPLE'S MOBILE HOSPITAL, BOMBAY

In an article published in the American Reporter dated 25th April, 1951 Sri Prabhakar Lad describes Bombay's People's Mobile Hospital (P.M.H.) as a 'dream come true'. He writes:

Run on American lines the institution's five mobile units treat on an average 650 patients a day.

PMH vans are parked in an alley in Null Bazar. There is always to be seen long queues of hapless persons with blank faces and sunken eyes, awaiting the ministrations of PMH. The faith of men waiting in queues is amply justified: they get every care and attention at the hands of PMH doctors. The PMH doctors do their job with the zeal of missionaries. PMH units are to be seen everywhere in Bombay. They visit 18 areas in the city and suburbs regularly twice a day. The Queen's Barracks, the Colaba Refugee Camp, Versoba, a beautiful suburb on the seacoast, and the Jogeshwari Caves are all included in the run-schedule of PMH—its field of activity spreads even further, as far as the border of Thana district, some 20 miles from the city of Bombay.

PMH owns five fully equipped and self-contained units. On alternate days these units visit their areas. Patients are not charged any fees by PMH except when they are given injections. A mobile unit sometimes covers two areas in one trip where these are in the vicinity of each other or when the number of patients to be treated in any single area is small. In a crowded area like Null Bazar the number of patients is as high as 250. It is different at Mazgaon—here the mobile unit treats only some 40 patients a day.

PMH is mainly run on public charity. It is this reliance on public charity again that has prompted PMH's plan to erect a new, spacious building to house its various departments.

The PMH was born the first two units started with a donation of Rs. 23,500 from the Khetani Brothers, Mr. Manubhai M. Doctor and Mr. Kishore V. Thakkar volunteered their services. Mr. Manubhai Doctor is today the zealous General Secretary of the institution.

The erection of two buildings comprising PMH premises at Worli would have normally cost the institution Rs. 1,30,000, but thanks to the generous help rendered by Messrs. Shapurji, a reputed firm of architects, and Messrs. Unit Construction Company, the cost was only Rs. 70,000. In the newly erected PMH building there are, in addition to the residential quarters for the staff, a dining hall, a mess, a dispensary, a storeroom for drugs, chemicals, hospital instruments and appliances and a pathological laboratory. Sixty-year-old Dr. J. L. Saldanha is the head of the pathological department. Once an Acting Dean of the Grant Medical College, Dr. Saldanha has also worked as pathologist in the J. J. Hospital.

The PMH store and the pathology department were opened in April last year. The store sells injection medicines and drugs to patients visiting the dispensary at a nominal cost. Dr. R. J. Gordhandas is in charge of the dispensary.

Precisely at 7-45 A.M. PMH units leave the headquarters for the various work areas allotted to them. Usually they work two shifts a day—from 8-00 to 11-30 in the morning and from 2-00 in the afternoon to 5-00 in the evening. There is a doctor, a compounder and a driver in each unit. The dressing part of treatment is done by the driver. The upkeep of a mobile unit costs about Rs. 1,750 a month, excluding overhead charges for office maintenance and the cost of residential acommodation for the staff.

Last year the mobile hospitals treated 230,256 patients, an average of 650 patients a day.

A managing committee of 21 members conducts the affairs of the institution. The present President of PMH, Mr. B. A. Dalal, a former chairman of the Standing Committee of the Bombay Municipal Corporation, has brought new vigour into the organization.

The daily work of PMH is supervised by Dr J. M. Doctor, the Chief Medical Officer of the institution. The full-time doctors are paid an initial salary of Rs. 225 per month.—*American Reporter.*

INDIAN AMBULANCE UNIT IN KOREA

The 60th Indian Field Ambulance Unit has been praised for the excellent medical care it is giving to wounded U.N. soldiers in Korea by Voice of America correspondent, Robert Lasher, in a special dispatch from Korea.

Lasher first met members of the unit at Taegu where he noted the work they were doing on behalf of Korean civilians there. His latest dispatch describes the parachute jump which 13 Indian medics made at Munsan, Korea, on March 23, along with

American soldiers of the 187th Airborne Regimental Combat Team.

Lasher, who himself jumped at that time, reports: "My next meeting with men from the 60th Field Ambulance Unit occurred in a rice paddy field, 25 miles behind enemy lines. It was at Munsan, March 23, just half an hour after the first of the men from the 187th Airborne Regimental Combat Team jumped in their now famous airborne attack against the enemy. including Col. Rangarraj, Maj. Banerjea, a team of Thirteen members of the 60th Unit jumped with them, surgeons and litter bearers.

"As I talked with Col. Rangarraj on the Musan drop zone, his men were coming and going with stretchers bearing men injured in the jump and in subsequent combat. The Indian doctors were setting broken legs. While the sounds of battle echoed in the hills all around us, Col. Rangarraj told me that they had already treated patients and transferred them as rapidly as possible to the Helicopters that were flying on round trip schedules from hospitals on our own side of the lines. For the next four days, the men of the 60th Field Ambulance Unit were often under enemy mortar and shell fire as they collected and treated the wounded."

Later, back in a rest area, Lasher talked further with Maj. Banerjea. "I asked him", he writes. "how the Unit happened to volunteer for such a hazardous mission. He said the subject had come up just a few days before the jump when Lieut.-Gen. Matthew B. Ridgway, then Commander of the U.S. Eighth Army. had visited the Unit. Gen. Ridgway, like many of the Indian medics, is an old para-trooper."

"During the course of the conversation, according to Maj. Banerjea, he and Col. Rangarraj offered the services of their paratroop medical men for use in any airbone assault that might be contemplated. 'Gen. Ridgway thanked us warmly', the Major said, 'but gave us no indication that an airborne attack was planned.

Lasher explains that the preparations entailed packing medical equipment, bundles to be dropped simultaneously from the planes with the men. These bundles contained stretchers, blood plasma, sterilizers, bandages, surgical instruments and medicines. All the Indian medics carried first aid kits on their persons.

INTERNATIONAL CONGRESS OF ANÆSTHESIOLOGY

The Directrice de Centre Culturel, Ambassade De France, Aux Indes, 24, Park Mansions, Calcutta-16, informs that the French Society of Anesthesy and Analgesy, has decided to organize an International Congress of Anesthesiology in France to be held at the Hospice de la Salpetriere on 20th, 21st and 22nd September, 1951. The Congress is to take place immediately before the International Congress of Surgery.

Those who are willling to send delegates to the Congress may contact directly, for further information, the Secretariat Administratif de la Societe Francaise d' Anesthesie et d' Analgesie, 12 rue de la Seine—Paris 6 e.

CARDIOLOGICAL SOCIETY OF INDIA

The Annual General Meeting of the Cardiological Society of India was held at the Agra Medical College on 27th February, 1951, and Dr. T. K. Raman (Vizag.) was elected President for the year.

In a resolution passed at the meeting, the Central Government and the Governments of the various States in India were requested to appoint a "Cardiac Committee" of experts in every State, in consultation with the Cardiological Society of India, and to refer all cases of new appointments which are rejected by the Medical Boards for organic or functional heart disease to this Committee for expert opinion before any final decision is taken. The resolution also urged that all cases of heart diseases occurring in State servants who are willing to return to work should be referred to this Committee whose recommendations regarding future terms and conditions of services should be accepted by the State.

In another resolution the universities and other examining bodies were requested to include the subject of Rheumatic Fever in the curricula of degree or diploma course.

The meeting also resolved that special cardiology departments be opened in all teaching institutions, and post-graduate teaching centres in cardiology be also set up with proper equipment.

(*Continued from page 388*)

still had the same abdominal tenderness and pain which led to their operations in the first place, but lost it after completing amœbicidal therapy. Five patients had lost weight and regained it after therapy.

Arthritic involvement was most predominant in the spine as expressed in segmental spinal tenderness, muscle spasm and radicular neuralgia, the latter particularly in the intercostal spaces adjacent to the sternal borders. With the incidence of eight cases, the cervical portion of the spine was by far the most frequent seat of these changes. Four cases presented involvement of the larger joints, in one case to a crippling extent. Four other cases showed arthritic involvement of the interphalangeal articulations. Three cases of the ten definitely can be classified as rheumatoid arthritis. All ten cases were infected with *Ento histolytica*, three of them representing mixed infections with *Endamœba coli, Chilomastix mensnili* and *Giardia lamblia*. Subsequent courses of carbarsone and diodoquin were employed in the therapy of every case. A course of carbarsone consisted in the administration of 0·75 gms. daily for seven days; whereas, diodoquin was given at a daily dose of 1·8 gms. for three weeks. Emetine hydrochloride was used in conjunction with this therapy wherever an enlargement of the liver, or an elevation of the temperature was present. In these cases, the presence of amœbic hepatitis was assumed and emetine hydrochloride was deemed to be more effective against trophozoites of *Ent. histolytica* in tissues outside the intestinal tract than oral medication alone.

CORRESPONDENCE

The Editor is not responsible for any views expressed by the contributors

MODERN TREATMENT IN GENERAL PRACTICE

Sir,—We are very much indebted to you for the brilliant idea of bringing out a Special Treatment issue of the Journal in October, 1950.

It is a boon to such of us who are practising in the mofussil and who do not get opportunity of reading the latest journals. Such journals are neither available here nor can we get them in number to go through most of them.

Under such circumstances it fulfils a great need by supplying most useful information in such a condensed form.

Now we would request you to bring out such issues occasionally and to devote one or two articles in each issue to the study of such common ailments.

I hope you will bring out another such issue very shortly and include in it some more common things which you were obliged to omit in this issue due to want of space.

I would like to suggest one or two subjects which may be included, if possible:

1. Treatment of acute and chronic nephritis.
2. Treatment of cholera and its complications.

I am, etc.

Balia. GUR HARAKH SINGH, B.SC., M.B.B.S.
7-11-50.

INTER-RELATIONSHIP BETWEEN VITAMIN E AND SEX HORMONES

SIR,—Re: the above article published in *J. Indian M. A.*, **20**:98, 1950 it may be said that vitamin 'E' belongs to a group of compounds known as 'Tocols' which are 6-hydroxychroman derivatives with a 'CH_3' and a '$C_{16}H_{33}$' side chain on the 'C_2' of the chroman nucleus. Thus vitamin 'E' or tocopherol is a 5, 7, 8 trimethyl-tocol. Other derivatives, *i.e.*, the 5, 8 and 7, 8-dimethyl, and the monomethyl tocols are also known compounds which exhibit varying degrees of vitamin 'E' activity. All these compounds are normally synthesised by condensing phytol with the corresponding hydroquinones. Thus the tocopherols are not 'tetrohydronaphthalene derivatives' as are probably indicated in the above article.

In the probable synthesis of progesterone from tocopherol, the author has not mentioned, if his scheme represents a biological synthesis or a laboratory synthesis. If it is the former, many stages described by the author do need experimental verifications. The last stage of conversion of IV to progesterone needs special emphasis!

The biological *in vivo* conversion of one compound into another is only beginning to be understood. Although spectacular configurational diagrams may be used to represent schemes, such representations will be of any value, if there is some experimental proof to that effect. Mere biological activity may not be a sufficiently strong proof for the postulation—an 'interconversion hypothesis'.

Although vitamin 'E' may have a very fundamental role in the animal nutrition, it still remains a 'mysterious intruder' in the vitamin family and its sparing action of progesterone and testosterone could not be substantiated on a statistical basis. As it stands at present it is too premature to postulate an 'interconversion hypothesis'.

The above are my views in connection with some of the statements made in the above article, which may please be published in the 'Correspondence Section'. I am, etc.

Mattanchari, Cochin. S. B. RAO.
26-12-1950.

TREATMENT OF HERPES ZOSTER

Sir,—Kindly print the following experience of mine on herpes zoster in your journal for comment by the medical world:—

I read so often in books of 'medicine' as well as in medical journals that we have no satisfactory treatment for herpes zoster and every book mentions vitamin B_1 as the treatment.

I may boldly say now with my experience of about twenty cases that vitamin C is definitely the surest curative for herpes zoster.. In every case of mine, with one, two or three intravenous injections, the acute burning sensation disappeared completely and the vesicles started drying. By fourth or fifth injections, which rarely are necessary, the scabs drop down leaving quite healthy skin behind.

So, I request medical men to quote their experience if they have any or try the remedy in their cases; and I request the research workers to throw light whether the remedy really works as I have seen it working and if so, how it works. I am, etc.

Vile, Parle. J. D. VOHRA, B.SC., M.B.B.S.
19-1-51.

CURRENT MEDICAL LITERATURE

Atypical Pneumonia

Stuart-Harris (*Brit. M. J.*, **4**:1457, 1950) writes that primary atypical pneumonia is a syndrome of respiratory-tract infection characterized by varied symptomatology, by radiological changes of a particular character, and by lack of therapeutic response to the sulphonamides or to penicillin.

The syndrome became recognized with increasing frequency from 1934 to 1940 partly because of the introduction of sulphonamides and the wider use of radiology, but possibly also because of its occurrence in young adults in a severe form. The psittacosis group of viruses, *R. burneti*, and the influenza viruses are established causes, but only of a minor percentage of cases of the syndrome.

Epidemiology varies from sporadic cases to explosive outbreaks, according to the causative agents. Family infection and case-to-case spread is found not only in psittacosis infections but also in cases of undetermined epidemiology. The incubation period is 5 to 19 days. The incidence increases during outbreaks of undefined acute respiratory disease.

Clinical features are those of a benign respiratory-tract infection with cough and sputum, fever, malaise, and headache. Signs suggest a bronchitis rather than a true consolidation. Radiographs reveal more extensive changes than the clinical signs suggest, and hazy opacities or diffuse mottling may be found contrasting with denser opacities of bacterial pneumonia. Q fever may cause onset with pleuritic pain, but it is not distinct clinically from other atyphical pneumonias.

Diagnosis depends on the total clinical picture, but may be aided by cold agglutinin tests in that form of the syndrome of undetermined aetiology. Laboratory investigations are essential to the diagnosis of the particular agent concerned in the syndrome.

Treatment by aureomycin gives considerable promise of success in atypical pneumonia of undetermined aetiology, in Q fever, and, possibly, in psittacosis.

Pneumoperitoneum and Streptomycin in Tuberculosis

Sun (*Chinese M. J.*, **68**:327, 1950) writes:

40 cases of pneumoperitoneum in adjunct to streptomycin therapy are reported, with 13 cases in addition to phreniclasis. Its early results are analysed. They are: 63 per cent much improved, 20 per cent slightly improved and 18 per cent unimproved.

Pneumoperitoneum is a simple and safe procedure and is one of the effective collapse therapies, if it is used in selected cases.

Comments are made in details on competent literature with regard to the effectiveness and usefulness as well as complications, of pneumoperitoneum.

A tentative table of indications and contraindications for pneumoperitoneum is suggested below:

Indications—Group I: Pneumoperitoneum under first consideration:

(A) Chronic productive tuberculosis:

(*a*) In moderately advanced bilateral diseases, lesions in either upper or lower zones, when unilateral pneumothorax is not indicated and at the same time bilateral pneumothorax to be avoided.

(*b*) In far-advanced diseases when the lesions are too extensive in one or both lungs with many cavities that pneumothorax or thoracoplasty is not indicated.

(*c*) In chronic extensive bilateral disseminated diseases, particularly when honey-combed cavities are present.

(B) Acute exudative tuberculosis:

In acute exudative progressive diseases and caseous pneumonia, which are best treated in combination with streptomycin.

Group II: Pneumoperitoneum in preparation for pneumothorax:

(*a*) When the acute or chronic diseases under Group I are improved with pneumoperitoneum treatment but cavities are not completely collapsed, pneumoperitoneum can be reverted to pneumothorax to collapse the residual cavities. The period of the preparation may be 6 to 10 months with pneumoperitoneum alone or 2 to 6 months with pneumoperitoneum as an adjunct to streptomycin.

(*b*) In the chronic and acute diseases under Group I, when one lung has reverted to unilateral pneumothorax, pneumonitoneum can be continued as a supplementary measure to control the lesions in the contralateral lung, if it is still active.

Group III: Pneumoperitoneum in preparation for major operation:

(*a*) In cases under Group I, when residual lesions and cavity remain in one upper lung while the contralateral lung lesions have been completely absorbed or arrested, pneumoperitoneum can be reverted to thoracoplasty (including primary thoracoplasty).

(*b*) In cases where pneumothorax has failed or been ineffective, and where thoracoplasty is indicated, pneumoperitoneum may be induced beforehand, if the major operation cannot be done at once because of active bronchogenic spread in the contralateral or homolateral lungs.

Group IV: Pneumoperitoneum as an alternative to pneumothorax, if thoracoplasty is not indicated:

(*a*) After pneumothorax has failed.

(*b*) After pneumothorax is ineffective and pneumonolysis is considered not feasible.

(*c*) After pleurisy or empyema has developed in an effective pneumothorax which is going to be obliterated, pneumoperitoneum is created to maintain a sufficient long time optimum collapse of the diseased lung.

Group V: Pneumoperitoneum in addition to phreniclasis:

(*a*) In cases where main lesions are in one lung and the elevation of the hemidiaphragm is not adequate, phreniclasis can be added to pneumoperitoneum.

(*b*) In cases after phreniclasis; when there is no adequate elevation of the hemidiaphragm or when there is active lesion in the contralateral lung, pneumoperitoneum can be supplemented to phreniclasis. It must be emphasized that when pneumoperitoneum is adequate, phreniclasis is not necessary, in order to avoid the possibility of a permanent paralysis.

Group VI: Pneumoperitoneum as a palliative measure to relieve symptoms:

In the following cases, of pulmonary tuberculosis, when all other collapse therapies are contraindicated, pneumoperitoneum may be tried in an attempt to relieve symptoms. If pneumoperitoneum is not effective to help the condition, it can be stopped at once.

(*a*) In cases of ventilatory impairment such as pleural diseases which limit the expansion of the thorax, or diseases in the lung with impaired respiratory reserve.

(*b*) Aged persons with emphysema and consequent impaired respiratory reserve.

Contraindications—(A) Pulmonary lesions: Old fibro-cavernous or fibro-caseous lesions, especially with rigid cavity.

(*B*) Pulmonary lesions: Tuberculoma. Chronic pulmonary tuberculosis with bronchiectasis. Endobronchial tuberculosis when atelectasis or tension cavity exists.

(C) Patient's condition: Far-advanced, moribund diseases, or accompanied with extra-pulmonary tuberculosis which is not curable.

(D) Pleura: Massive pleural thickening with fixation of the diaphragm.

(E) Heart: Cases with heart failure.

(F) Abdomen: Big abdominal tumour. Pregnancy.

Bronchiectasis

Lander (*Brit. M. J.*, **2**:1486, 1950) in dealing with treatment of bronchiectasis writes:

The treatment lies in the eradication of infection in the dilated bronchi. This can be accomplished by posturing the patient so that he empties his bronchi at frequent intervals, and by giving him the drug specific to the organisms found in his sputum. The posture to be adopted depends on the bronchi which are affected. If they are anterior to the bifurcation of the trachea the patient should lie on his back on a bed, with the foot raised 6 to 9 in. (15 to 23 cm.) from the ground. If the left lung is involved he should lie partly on his right side; if the right lung is affected he should lie partly on his left side. If the bronchi involved lies posterior to the bifurcation of the trachea the patient must lie on his face mainly on the unaffected side, again with the foot of the bed raised. This raising of the bed can be accomplished by putting the bar connecting the legs of the bed on a low chair.

At first, sleeping all night in this position is necessary; more drastic postures can be adopted during the day. These consist of hanging over the edge of the bed so that the chest is almost vertical, head down. Upper-lobe disease, of course, does not need these postures, as the patient is draining his bronchi in the normal upright position.

The best resutls are obtained if this posturing is combined with a course of penicillin injections. Half a million units of procaine penicillin intramuscularly for 14 days in those whose sputum contains a majority of penicillin-sensitive organisms may produce complete cessation of the sputum. In some the sputum continues, though with decreased bulk, owing to the persistence of Gram-negative organisms. In such cases a short course of streptomycin injectionns, 1 gm. a day for five days, will help. If the original sputum examination shows a large number of Gram-negative organisms, then combined streptomycin and penicillin can be used.

Penicillin by inhalation does not give any better results than penicillin by intramuscular injection, but in a case with a large amount of purulent sputum and widespread disease both methods can be used simultaneously. The inhalation can be given by means of a Collinson inhaler, but this method needs an oxygen cylinder; there are many portable "atomizers" on the market which are efficient. The amount to be inhaled is about 5 ml. containing 100,000 units. The inhalations should be repeated three or four times a day.

The advances in surgical technique in recent years and the discovery of the sulphonamides and antibiotics have made lobectomy and pneumonectomy safe procedures. The mortality from these operations is probably less than the overall mortality from bronchiectasis. For this reason, many physicians and surgeons advocate operative treatment in all cases of bronchiectasis. This attitude is a lazy one, and ignores the possibility of giving an individual prognosis. All physicians must have seen patients with bronchiectasis who have lived long and useful lives in spite of their complaint. From the study of individual cases, by repeated examinations with radio-opaque oil, it can be shown that bronchiectasis is not always, or even often, a progressive disease. Whether the life of a bronchiectatic patient is worth living depends on the mental attitude of the sufferer, not on the presence of dilated bronchi.

If a patient is not prepared to practise postural drainage or to face the possibility of recurring infections necessitating, a further course of penicillin injections, then the surgical removal of the affected lobes must be advised. Similarly, there are patients to whom the burden of their complaint is so overwhelming that surgery offers the best chance of a happy life. Lobectomy may be a life-saving procedure in certain cases—for example, in the case with recurring, ever-increasing haemoptyses, and also in the case of a virulent infection which is partially or temporarily controlled by antibiotics.

Some patients suffer so severely from recurrent infections which although controlled at the time by antibiotics, nevertheless disorganize their lives so much that they are unable to earn a living. Such a case is best treated by the surgical removal of the diseased areas. It is the physician's duty to consider whether a patient would best be treated by surgery. The practicability of operation is decided by the surgeon.

In cases in which all five lobes of the lung are involved, surgical removal of the disease is obviously impossible, but bilateral disease is not of itself a contraindication to operation. No patient should be advised to have a bronchiectatic area of lung removed until the full benefit of a course of postural drainage and penicillin treatment has been obtained. Nor should operation be advised for at least a year after the presence of the bronchiectatic lesion has been first demonstrated.

Cirrhosis of the Liver

Sherlock (*Postgraduate M. J.*, **26**:472, 1950) in dealing with the treatment of cirrhosis of the liver writes:

The treatment of cirrhosis with liver cell failure is very disappointing. The best results occur when the failure has a very clear precipitating cause. Thus an acute infection may respond to antibiotics, and the anaemia of a gastrointestinal

haemorrhage be relieved by blood transfusion with consequent liver cell regeneration and a return to a compensated state. If the liver cell failure is related to an acute alcoholic episode, recovery of function may follow abstinence and, in general, all patients with cirrhosis should become total abstainers. Where there is no apparent cause for the failure or when the cause has been treated, the management of the patient must be on more general lines.

Bed rest is essential and should be continued while improvement continues. The work of Patek and his group showing the advantages of a nutritious diet in the treatment of cirrhosis was a landmark in the field. Their present regime includes a 3,500 calorie diet containing 140 gm. protein, 175 gm. fat and 365 gm. carbohydrate with 50 gm. powdered brewer's yeast. It may be difficult to persuade the patient to take such a liberal diet, moreover this may not be necessary. Good results are recorded with a basic calorie and protein intake, provided bed rest is emphasized and alcohol forbidden. The addition of methionine and choline is said to be of value as is intravenous 'crude' liver extract. Moreover, excess amino-acids given to a patient with active liver disease may further strain hepatic metabolism and be injurious. It is therefore difficult to assess the value of these various therapeutic agents. A reasonable regime seems to be a diet containing about 2,500 calories with 100 gm. protein. Fat need not be restricted within the caloric total. Fresh brewer's yeast, if tolerated, can be given in one dessertspoon doses stirred in milk three times a day. This provides additional first-class protein and also the vitamin B complex. Further dietetic supplements are not necessary.

Ascites modifies the treatment. Paracentesis abdominis is only palliative and results in great loss of body protein. Measures must be taken to prevent the fluid reaccumulating and of these the most helpful is the restriction of sodium chloride intake. A cirrhotic patient who is accumulating ascites can, by both renal and extrarenal channels, excrete only 1·5 gm. sodium chloride daily. Every gram of sodium chloride taken above this amount means that 100 ml. water will be retained in the tissues. Sodium chloride intake should, therefore, not exceed 1 gm. daily. It may be difficult to maintain the protein content of such a diet without the use of low salt content bread and low sodium milk powder. Mercurial diuretic may also be useful in the prevention of further ascites. Human salt-poor albumin infusions have been used to raise the serum colloidal osmotic pressure but are of only transitory value and untoward reactions to them have been reported.

The treatment of portal venous hypertension is largely surgical and is chiefly concerned with anastomosis of the portal and systemic venous systems. In cirrhosis there is already intrahepatic obstructions to the portal vascular bed and further diversion of portal blood into the systemic veins is not attended by any serious effects on the liver cells. Most patients with 'alcoholic' cirrhosis have disturbed liver cell function and candidates for porto-caval anastomoses are usually found in the group of younger subjects with post-hepatitis cirrhosis. In these patients normal liver cell function may exist with gross portal venous hypertension.

The treatment of bleeding oesophageal varices depends on the severity of the haemorrhage A small ooze may stop spontaneously with or without blood transfusion. Severe haemorrhage can some times be checked by the introduction of a balloon into the stomach which, after inflation, is drawn up against the cardia by means of traction on the rubber tube to which the balloon is attached. Porto-caval anastomoses performed as a surgical emergency to relieve portal pressure and stop haemorrhage are fraught with considerable hazard. The injection of oesophageal varicosities through an oesophagoscope is rarely attempted nowaways. The danger of full doses of morphine to cirrhotic patients with bleeding oesophageal varicosities must again be emphasized.

Management of Status Asthmaticus

Elsenstadt (*Minnesota Med.*, **33**:983, 1950) writes:

The basic principles involved in a proper therapeutic approach in the treatment of status asthmaticus are (1) to increase the lumen of the respiratory passageway, and (2) to decrease the minute volume of respiration.

The following discussion sets forth a routine for the treatment of status asthmaticus which has produced the most favorable response.

Hospitalization—Hospitalization should be insisted upon immediately. This will acomplish several indispensable purposes. First, the patient is removed from intimate contact with overanxious relatives. Further, the hospital offers trained personnel, equipment and medicinal agents not readily available in the home.

Although most of the patient fall in the chronic intractable or infectious group, environmental factors should not be overlooked.

Reassurance—The patient must be reassured that the attack is controllable and that his co-operation is necessary to obtain results. A friendly, sympathetic and reassuring attitude on the part of the attending physician is a most vital and helpful therapeutic aid.

Cessation of all Epinephrine and Ephedrine Compounds—All sympathomimetic medications should be removed for a period of forty-eight to seventy-two hours, preferably the latter, and only then retintroduced.

When reintroduced, small quantities should be given, 0·3 to 0·5 c.c. (5 to 8 minims), and repeated as often as necessary, even within fifteen or thirty minutes. The smaller quantities will obviate the side effects of epinephrine and will produce the same therapeutic effect as larger quantities. It is preferable to use the aqueous (1-1000) epinephrine, rather than the prolonged type (1-500) in sesame oil, peanut oil, or gelatin.

Hydration—These patients are dehydrated. They have been sick for a number of days without sleep, food or fluids. This is evidenced on admission by the very noticeable relative increase of the blood haemoglobin, red blood cell count, white blood cell count with a normal differential, along with a minimal increase of body temperature of about a degree. These soon return to normal after adequate hydration within twenty-four to forty-eight hours.

2 to 3 liters of 5 per cent glucose in distilled water and in isotonic sodium chloride solution alternately is routinely given during the first two or three days of hospitalization. The addition of fluids will replace lost body water and bring about a positive water balance. They tend to thin out the bronchial secretions and thus promote expectoration of the

thick, gelatinous, inspissated mucous plugs in the bronchi. The dextrose used in hydration therapy will supply needed calories and replace liver glycogen, badly depleted because of the previous repeated injections of epinephrine and the failure of the patient to take adequate nourishment. Glaser suggests that this depletion of glycogen may be a factor in the development of epinephrine fastness.

Aminophyllin (Theophylline with Ethylenediamine)—The bronchodilating effect of aminophyllin intravenously at times is life-saving. Initially, the patient should receive 0·25 gram (3-3/4 grains) in 10 c.c. of diluent given slowly, preferably through a fine needle. If this dose is sufficient for symptomatic relief, it can be repeated every four to six hours. If relief is only partial, the dosage may be increased to 0·5 gram (7½ grains) in 20 c.c. of diluent. When given slowly and regulated to the patient's tolerance, the toxic effects of aminophyllin, such as vertigo, faintness, headache, tachycardia, palpitation, extreme flushing and sense of heat, substernal distress, and nausea and vomiting may be obviated. If they do occur, they may be minimal. In uncomplicated asthma, aminophyllin is not a dangerous drug. However, in the presence of cardiac complications caution must be used. The need for repeated intravenous injections of aminophyllin may be lessened by inserting of 0·5 gram of aminophyllin per liter of fluid during the period of venoclysis.

The drug is also moderately effective when given rectally, either in suppository form or as a retention enema. The suppository contains 0·5 gram of aminophyllin. One-half gram of amino-phyllin powder dissolved in 30 to 60 c.c. of tap water may be used as a retention enema. Given in this manner, it can be repeated repeated every 6 to 8 hours.

Continuous intravenous aminophyllin in status asthmaticus has recently been introduced by Goodall and Unger. Dosage consisted of up to 2 or 3 grams of aminophyllin dissolved in 2,000 c.c. of 5 per cent glucose in physiological salt solution or distilled water. The solution is given continuously over a twenty-four-hour period for several days until relief is afforded.

These is no particular advantage to this method, because the same coverage can be achieved by employing repeated intravenous injections of aminophyllin together with rectal suppositories or retention enemas, without the extreme inconvenience to the patient of having a needle in his vein continuously for three or four days. This is extremely important when considering that the patient in status asthmaticus is already in extreme discomfort because of his marked dyspnoea.

As in the case of "epinephrine fastness", when patients become refractory to aminophyllin by intravenous injection or aerosolization, its use should be discontinued, as further dosage will serve only to increase its toxic effects.

The use of intravenous aminophyllin in the treatment of children may be employed in the same manner, the dosage being 0·006 gram per kg. (1/20 grain per pound).

Inhalation Therapy—Inhalation therapy is directed toward decreasing the minute volume of respiration. It rarely of its will interrupt status asthmaticus, one must be extremely careful to make the patient more comfortable by diminishing the extreme respiratory effort caused by the anoxia, by enriching the surrounding air with oxygen.

Oxygen may be employed with a tent, nasal catheter, or B.L.B. mask. At times, patients will rebel against the use of a tent because of a feeling of claustrophobia. This may increase their anxiety and nervousness, with resultant increase of their exertional dyspnoea.

Sedation.—In employing sedation, one must guard against over-sedation. However, measures to insure sleep and to overcome nervous tension are very necessary. We have used Demerol repeatedly, but with considerable caution. Used judiciously, it has proven to be a most effective drug. Its action has apparently been twofold, sedation and a direct bronchodilating effect. In status asthmaticus, one must be extremely careful about respiratory depression and depression of the cough reflex, effects which are relatively minimal with Demerol as compared to the opiates.

In this connection, mention should be made concerning the use of morphine. However, one can say it should never be used in asthma, and especially so in status asthmaticus, where the patient is anoxic, exhausted and battling for life. Morphine depresses the respiratory center, diminishes the cough reflex and dries the bronchial secretions (especially if given with atropine). Thus, morphine actually promotes further anoxia—to the point of asphyxia—which is the very thing we are trying to combat. Because of the stagnation of the bronchial mucous plugs, the patient literally drowns in his own bronchial secretions. Vaughan and Lamson have shown that in many deaths due to asthma during status asthmaticus, morphine was given prior to death. The use of all other opiate derivatives should also be avoided.

The dosage of Demerol should be regulated with extreme care. Adults should never be given an initial dose exceeding 50 mgm. intramuscularly. It may later be necessary to increase to 75 mgm., and only rarely to 100 mgm. This can be repeated at six to eight hour intervals. It should be used for relatively short periods, three, four or five days, because of the possibility of addiction.

Other sedative measures have been advocated by others and some of these are:

(1) Paraldehyde may be given rectally, 15 c.c. in 100 c.c. of olive oil at twelve-hour intervals.

(2) Barbiturates may be given at four to eight hour intervals.

(3) Chloral hydrate, 1 gm., and sodium bromide, 4 gm., may be given at four-hour intervals until the patient becomes drowsy; then stopped.

(4) A mixture of ether, 2 oz., and olive oil, 4 oz., mixed thoroughly, may be administered as a retention enema.

If any of the above are employed, only one should be used and not a combination. If used properly and carefully, sedation is extremely beneficial and life-saving. Its drastic use in an already exhausted and anoxic individual may be dangerous and disastrous.

Expectorants—Methods which will thin out bronchial secretions and thus will help clear the bronchi of their mucous plugs are highly desirable. The best medication to achieve this is potassium iodide. If the patient is unable to take the drug orally, it may be given intravenously as sodium iodide. One gram may be added to a liter of the solution for intravenous administration by the drip method. If there is an intolerance to potassium iodide, enteric coated ammonium chloride tablets in 0·5 gram doses may be given four times daily.

In children, emetic doses of ipecac will produce forceful emesis and with it expectoration of mucus and clearing of the bronchial tree.

Manual Elevation of the Diaphragm—In the presence of status asthmaticus physiological pulmonary emphysema is present. There is trapped air because of the partially and completely occluded bronchioles. Manual elevation of the diaphragm, as suggested by Gay, is often followed by subjective relief as well as an increase in the vital capacity from 200 to 1000 c.c. The procedure is carried out as follows: the palm of either hand is placed underneath the ribs on one side and pushed upward and inward during the latter half of expiration. Then this is repeated on the other side. The escape of trapped air may frequently be heard as a wheeze. This procedure should be repeated three to four times daily.

Antibiotic Therapy—With the advent of antibiotic therapy, another powerful weapon has been added. As stated earlier, most patients in status asthmaticus belong to the chronic intractable or infectious group. Frequently an accompanying infection of the bronchi has been the cause of the status asthmaticus. The presence of infection is noted clinically by an increase in body temperature, elevated sedimentation rate, the presence of muco-purulent or purulent sputum, and leucocytosis with an increase in the polymorphonuclears.

The use of combined parenteral and aerosol penicillin therapy, is recommended so that the penicillin may reach the more superficial and deeper lying tissues of the bronchi in high concenrtation. Fifty thousand units of penicillin in 1 c.c. of distilled water, to which 3 or 4 drops of glycerin are added to stabilize the aerosol, are nebulized every three hours, with a six-hour interval during the sleeping hours. If the penicillin aerosol is to be continued after the epinephrine-fastness has been broken, it is advisable to precede the inhalation of penicillin by the inhalation of a few breaths of 1:100 epinephrine, or 1:200 isuprel so as to widen the lumen of the lung. Vrey often, this therapy will have to be prolonged for five to ten days following responsiveness to epinephrine until the patient's bronchial secretions are free of discoloration and are at a minimum. At the same tmie, penicillin is administered parenterally with daily injections of 300,000 units of prolonged acting penicillin.

Antihistaminics—The recently introduced antihistaminic drugs are of little or no value in this condition. In fact, they are contraindicated, as they possess an atropine-like effect in drying up bronchial secretions, and thus aid in producing mucous plugs. Before substituting these medications, the action of which is neither so certain nor so prolonged, it is well to remember that epinephrine and epinephrine-like compounds are the most powerful antihistaminic agents now in use.

In summary, when one is confronted with a patient in status asthmaticus, the danger of death is ever present. The judicious use of the above procedures may be lifesaving.

Peptic Ulcer with Protein Supplements

Morrison (*Rev. Gastroenterol.*, **17**:1058, 1950) writes:

In a series of 20 patients with chronic peptic ulcer who were ambulatory and seen in gastroenterologic office practice, the oral feedings of a protein supplement mixture for periods up to 3 weeks resulted in the following:

A. The time required for relief of pain was half that noted on the conventional modified ulcer Sippy regime.

B. The time required for x-ray evidence of ulcer healing was approximately half that seen on the conventional modified ulcer Sippy regime.

C. The buffering, antacid action of the mixture is such that a therapeutic feeding is effective in most cases of maintaining a gastric achlorhydria for an average of 80 minutes.

The palatability and patient acceptance of the protein supplement was striking, the mixture being accepted without reservation by patients.

A protein supplement was found to be a highly effective superior therapy in the dietary treatment of chronic peptic ulcer. The protein supplement used in this study consisted of 60 per cent protein, 1·5 per cent fat, 27 per cent carbohydrate, 6·3 per cent minerals and 5 per cent moisture; the protein content is derived principally from the milk proteins casein and lactalbumin and a small portion from egg albumin and soyabean. The carbohydrate consists mainly of lactose.

Pulmonary Amoebiasis

Mukherjee (*Indian M. Gaz.*, **84**:250, 1949) writes that amœbiasis is protean in its manifestations, but it is claimed that its pulmonary features have been detected only comparatively recently. Clinically these may be classified into the following types: (1) symptomatic, (2) secondary and (3) primary.

(1) *Symptomatic pulmonary amœbiasis* is quite common in its clinical features. On examination the liver is found to be enlarged and tender, while auscultation of the chest reveals a pleural rub.

There is another form in which amœbic abscess and amœbic hepatitis are associated with signs of right basal involvement, characterized by feeble breath sounds and impaired percussion note.

(2) *Secondary pulmonary amœbiasis* is more common, although its incidence is becoming less owing to earlier recognition and effective therapy of amœbic hepatitis.

(3) *Primary pulmonary amœbiasis* is rare and is probably due to embolism from the bowel wall. Clinically two types have to be differentiated:—

(*a*) Amœbic pneumonitis—The pulmonary reaction to amœbic invasion is not characterized by gross tissue destruction. Of all the pulmonary cases it most closely resembles pulmonary tuberculosis.

(*b*) Pulmonary amœbic necrosis.—Extensive destruction of pulmonary tissues, simulating lung abscess, characterizes this type.

Arthritic Complaints in Amoebiasis

Zinneman (*Am. J. Digest. Dis.*, **17**:342, 1950) from analysis of 10 cases of amœbiasis with arthritic complaints observe:

The average age of the patients was 45·9 years, eight were females, two males. The most frequent symptoms at the time of their first examination were fatigue (8 cases), backache and chest pain (7 cases), occipital head and neckache (6 cases), due to spasm of the posterior neck muscles. Tenderness and pain in the lower abdomen ranks next with the incidence of five cases. In this connection it may be interesting to remember that five patients had appendectomies, two of them also right oophorectomies. Four of these individuals

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SUPPLEMENT
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XV U. P. PROVINCIAL MEDICAL CONFERENCE—The fifteenth Uttar Pradesh Provincial Medical Conference was held at Moradabad on 20th and 21st November 1950. The conference was presided over by Dr. A. C. Banerjea. The Chairman of the Reception Committee, Dr. L. N. Goel offered his welcome to all the delegates and guests. The Hon'ble Sri C. B. Gupta, in course of inaugural address to the gathering said:

A body of scientific men, which acts without fear and without favour, is a national asset which the Government and the people value. It is my earnest desire that independent opinion in the profession may continue to grow and be the people's guarantee for sound national policies.

In no area of knowledge and practice are changes occurring more rapidly than in Medicine and Public Health. If only we could be freed from the insanity of another war it would be reasonable to expect that within a short period ravages of diseases like cancer, tuberculosis, infantile paralysis and perhaps some of the degenerative orders may be limited."

DR. A. C. BANERJEA
President, XV U.P. Provincial Medical Conference, Moradabad, 1950

PRESIDENTIAL ADDRESS

The following are excerpts from the presidential address delivered by Dr. A. C. Banerjea at the Moradabad Conference held on 20th December, 1950:—

You are all aware of the dark shadows in the health picture of the State, and of the magnitude of the problem. It is not for us to apportion responsibility for the grim facts which stare at us to-day, nor will it do us any comfort to compare our health conditions with those of other countries which are far ahead of us. It is with the future that we are concerned, and unless a natoin-wide interest is aroused, and an all-out effort made, no substantial improvement in our present health conditions can be made. One cannot, except in a very general way, assign money value to health, but it is obvious that the loss which the province annually suffers through an avoidable waste of human life and the lowering of human efficiency through malnutrition and preventible diseases must be colossal.

We have now before us for some years the report of the Health Survey and Development Committee, known as the Bhore Committee report, which has exhaustively dealt with the question of health and made very detailed recommendations for the future health planning of the country. We have also the Report of the U. P. Medical and Public Health Reorganization Committee which has made recommendations for the future Health Planning of the State. I have been intimately associated with both these Committees, and am of opinion that they provide a blue-print which can be effectively put into operation by stages, provided a target is fixed and provided there is planned thinking. I am now associated with the Planning Commission constituted by the Government of India for the economic development of the country, in which, I am glad to say, the future health programme finds a definite place.

Activities within the field of health, encompass a broad range of services which include the promotion of health, prevention of disease, diagnosis and treatment of disease and the rehabilitation of incurables. Only with proper emphasis on all the phases of the health programme will it be possible to obtain the best results. Broadly speaking the health programme should make provision for—(*a*) training of medical and ancillary personnel; (*b*) expansion of existing health services; (*c*) promotion of medical research; and (*d*) education of people to arouse health consciousness and make them realise their responsibility in the matter of community health and personal hygiene.

Let me say at the outset that health problems are not limited by geographical boundaries, and as such, the acceptance of a common policy by the Centre and the different States of the Indian Union in respect of such a vital matter is of fundamental importance. The growth of parallel health

services in different States based on the indigenous systems (Ayurvedic and Unani), homœopathy and on modern medicine is to my mind a definitely retrograde step. These systems lack some of the essential scientific developments as modern surgery, bacteriology, preventive medicine, obstetrics, radiology, etc. which are of importance in diagnosis, treatment and prevention of disease. It is true that Ayurveda and Tibbi were practised centuries ago when in the absence of anything better they held sway not only in this country but in several other countries. Modern medicine has, however, made advances to such an extent particularly during the last fifty years that in the present context of scientific development it will be positively harmful to make Ayurveda and Tibbi the basis for development of remedial and preventive services in the country. It is true that good herbs and medicines can be borrowed from these systems and utilised for the benefit of the human ailments and have been done so already, but that does not go to make a system of medicine which will utilise all modern knowledge in the conquest of disease, promotion of health and improvement of general wellbeing of the nation.

Medical Education

The subject of medical education is of great importance not only to medical men but also to the Government and the general public, for on the standard of medical education depends largely the soundness of medical men, and the efficiency of health services and its usefulness to the community. In order to increase the number of medical personnel, larger number of students are being admitted every year to the medical colleges of the country without much regard to adequacy of equipment or the availability of necessary clinical material.

In medical education it is absolutely essential to have the closest contact between the teacher, the taught, and the patient, and this, I am afraid, is being sacrificed for the sake of quantity. Any lowering of the standard of medical education and practical training will have a far-reaching effect. The medical educationists of the country must realise their responsibility in this matter. On the one hand, the Government have recognised the necessity of having only one standard of medical education in the country for a basic doctor, and that standard shall be the M.B., B.S. course of the universities, and so have raised medical schools into colleges, but on the other, whatever good has been achieved in this direction has been set back by the introduction of a new course of studies for Ayurvedic and Unani systems of medicine under the term B.M., B.S. running parallel with the M.B., B.S. course in an already over-crowded institution which can hardly cater for the increasing number of regular M.B., B.S. students. We must view with great concern all attempts to lower standards of medical education on the plea that the country has to provide cheap doctors and dole out cheap medicines. Lowering of the standard of medical education is suicidal for the nation and will defeat the very object in view. Let there be only one policy in regard to medical education and one standard of general qualification and one yard-stick for all the doctors of the country.

In this connection I should also stress the place of social medicine in our medical curriculum. A part of the training programme for all health personnel should have a provision for developing community outlook.

Training of Ancillary Personnel

At present much of the time of medical men is wasted on routine work which can be entrusted to trained non-medical workers. It is, therefore, necessary to lay more emphasis than in the past, on the training of non-medical workers. They can, with adequate supervision, be made to perform a wide variety of curative and preventive health work. It is also necessary to develop different classes of technicians to relieve medical men of routine type of work in laboratories, x-ray institutes etc. so that the latter can give more time and energy to specialized work.

Medical Research

Medicine is a growing science, and the need for research and for application of the results of such research continues to grow. In the past our contribution in the field of medical research has been poor as facilities for research work have been meagre, and Indian workers in the past have not been properly associated by foreign masters in investigation works. Now that conditions have changed, the Government should provide proper equipment and material for conducting research. At present the staff attached to the teaching institutions have to do so much of routine work that they have little time to think and undertake research ; and there are only very few research institutes. I am, however, glad to know that the Government of India have allotted some funds to upgrade the different medical colleges in certain subjects for purposes of research and also have a proposal to start an all-India institute in Delhi.

Post-Graduate Medical Education

There are at present no suitable institutions for giving higher post-graduate training to our medical graduates, and the result is that the medical graduates have to go to foreign countries to obtain higher degrees. I am, however, constrained to say in this connection that the few post-graduate degrees which are awarded by our universities are regarded lower as compared to the corresponding foreign degrees by the very teachers who award them.

Expansion of Health Services

Preventive and curative medicines have reached a stage where they are no longer separable, and it is necessary at the present time to bring them together functionally. I am glad to say that with this end in view, most State Governments have amalgamated their medical and health departments at the top though it has not yet been possible except in one or two States to bring about integration at the periphery which really forms the pivot of health administration. It is not only desirable, but essential, that the doctor at the periphery in the rural dispensary dealing with the people directly should combine curative and preventive functions. This is also in accordance with the practice in foreign countries and has been strongly endorsed by the Bhore Committee.

In certain parts of the United States and other countries, an effort is being made for housing hospitals and health departments in one building with a view to co-ordinate their respective activities and to provide follow-up of cases. It is gratifying to note that in the past two years a large number of rural dispensaries have been opened in our State, but their housing condition is far from satisfactory. Most of the rural dispensaries are ill equipped and suffer from chronic shortage of funds with the result that they can render hardly any medical aid worth the name. The average grant of a rural dispensary is about Rs. 1200/- for medicines, drugs, dressings, etc. and the average number of cases treated in these dispensaries is about 40 thousand per annum which works out to

about 5 pies for the treatment of a case. It is obvious that no scientific treatment can be given within this meagre sum and this fact is largely responsible for failure to carry scientific medicine to the people. I realise financial limitations of the State. It is not possible to have a large number of well-equipped dispensaries throughout the country, nor is this necessary.

Rural dispensaries should be looked upon as primary health centres for the propagation of health ideals and as clearing stations after rendering first-aid. It will be more economical and administratively more feasible to have well-equipped regional dispensaries with all modern facilities for treatment, laboratory service, x-ray, dental equipment etc. which will cater for all the difficult and serious cases sent from the rural dispensaries. Along with the development of roads and improvement of communications, ambulance service should be established to connect rural dispensaries with regional hospitals and telephones provided so that in cases of emergency the medical officers of regional hospitals may run to rural units to give necessary aid or the patient carried to the regional hospital for treatment. At present rural dispensaries are located without any regard to communication, distances and local needs. Detailed recommendations with regard to the linking up of peripheral with the secondary units and regional dispensaries have been made by the Bhore Committee and U. P. Medical and Public Health Re-organisation Committee. These should be given effect to as soon as the State can afford funds and necessary personnel become available.

There is at present great difficulty in persuading medical men and women to work in rural areas owing to lack of amenities, suitable residential accommodation, and facilities for education of their children. These deficiencies could be met to a large extent if suitable housing accommodation could be provided and the rural doctors are given additional pay so that these appointments may be attractive.

In this connection I must point out that there is a very large number of dispensaries at present managed by local boards and the condition of these is far from satisfactory. In order to improve these it is absolutely essential that the existing medical institutions maintained or subsidized by local bodies should be completely provincialised.

Emergency Preparations for Public Health Disasters

I have often felt during epidemics the helplessness of the Public Health department and medical profession to meet emergency. Floods, hurricanes, explosions, epidemics and the like often assume disastrous proportion and require health organisations to protect the people. It takes time to put up the necessary organisation to fight these disasters and the time factor is responsible for human misery and loss of human lives which could be prevented if we had a skeleton organisation to meet such catastrophes. I would suggest every State should have an emergency reserve of medical men. All medical men below the age of 40 should constitute this reserve. They should be given necessary training and a retaining fee so that they can be immediately mobilised in times of emergency. If possible, medical graduates should spend some time of their early years in the military medical service. This emergency reserve of each State in the Indian Union will not only provide for the peace time emergencies but will also form a reserve for any national emergency like war.

Another point which I wish the Conference to consider is the necessity of greater liaison between the defence medical services and the civil medical services for the mutual benefit of both and the country.

Manufacture of Drugs, Vaccines, Sera, etc.

We depend very largely on foreign markets for most of the drugs, vaccine, sera and surgical appliances and hospital equipment. These could be easily produced and on a commercial scale in the country, which will not only prevent draining of country's wealth but increase its productivity and make it more or less independent in things which are of vital necessity to the nation. We all know how we suffered during the last war owing to paucity of foreign drugs. It is time now that the country established some large-scale pharmaceutical industries.

Health Services

At present there are two distinct wings in the health services—one preventive and the other curative both having the common object of alleviation of human suffering. Owing to the difference in the emoluments, amenities and prospects of the two services there does not seem to be healthy co-operation between the two with the result that the community suffers. Although there is a great shortage of medical officers in the health services generally, the shortage is more acute on the preventive side because of hazardous nature of their duties and correspondingly lower emoluments. I would appeal to the authorities to redress the inequalities between the two services so that there may be healthy competition and the services rendered by them may be of maximum good to the people. I should like to take this opportunity to bring to the notice of authorities the evil effects of undesirable pressure exercised by individuals under cover of party organisations on medical officers which tempt them to deviate from the path of honesty and do unprofessional practices. This not only demoralises but degrades the medical profession.

I should be failing in my duty if I omitted to stress the composite character of Public Health and to point out that attack upon one sector alone can only end in disappointment and waste of money and effort. It is fundamental that whatever care the Government provides, must be of the highest quality. The health of the nation demands the maximum employment of the present scientific knowledge to control disease, and of research to find new means for the prevention of disease. There can be no two opinions about the fact that the health of the State has been neglected and this state of affairs must not continue any longer.

Before I conclude I must again appeal to members of the medical profession to join in large numbers the Indian Medical Association which has done in the past immense service to the profession and to the people in India. Today the British Medical Association and the American Medical Association have in their registers almost all the members of the medical profession, with the result that they exercise a very definite influence in shaping the health policies of their countries. In this connection I would quote a few sentences from the speech of the Hon'ble Raj Kumari Amrit Kaur given at the Calcutta Conference of the Indian Medical Association, where she said :—

"The Association has reached the stage of healthy maturity and has established itself not only as a scientific body but also

as a guide, philosopher and friend of the medical profession in general and of the independent medical profession in particular. The time has come for us to see how best those in the Government employ and those outside can unite in serving the people in a sphere where uptil now they have been so poorly served."

Fellow Members

Ours is a noble profession and so we must strive to maintain the highest traditions and ethical code whatever may be the temptation to deviate us from the path of honesty and service. Let no politics enter into the sacred temple of medical profession whose only politics is 'Service of the suffering humanity'.

RESOLUTIONS PASSED

1. *Condolence*—A. This Conference expresses deep sorrow at the sudden and untimely death of Dr. K. S. Ray, one of the founders and the earliest General Secretary, a past President and Editor of the Journal of the Indian Medical Association. The Association has suffered irreparable loss due to his demise. The Conference expresses profound sorrow and deepest sympathy with the family in their sad bereavement.

B. This Conference expresses extreme sorrow at the very sad and sudden death of Dr. M.X.de Noronha, from sudden heart failure on December 29th, 1949 at Kanpur. By his death the I.M.A. has lost a very active and enthusiastic worker and his death is a great loss specially to the U. P. Branch. The Conference conveys its heartfelt sympathy to Mrs. Noronha and the bereaved family.

C. This Conference places on record its deep sense of sorrow at the demise of the following members of the profession and conveys its heartfelt sympathy to the members of the bereaved families:—

Dr. S. Mustafa, Allahabad; Dr. J. K. Mukerji, Allahabad; Dr. D. P. Ghosh, Banaras; Dr. S. K. Basu, Banaras; Dr. B. K. Mukerji, Bareilly; Dr. C. K. Kakkar, Bareilly; Dr. P. C. Hoon, Dehra Dun; Dr. K. N. Kapoor, Deoria; Dr. A. R. Sur, Faizabad; Dr. R. N. Kapoor, Kanpur; Dr. G. M. Hartley, Lakhimpur Kheri; and Dr. Dharampal Gupta, Najibabad.

2. *Medical & Health Reorganisation Scheme*—This Conference notes with satisfaction that the scheme of Reorganisation of Medical and Health Services in under active consideration of the Government, and the Conference hopes that the matter will be expedited as it is overdue. It is of utmost importance in the interest of the scientific medical progress and the people that the services be completely amalgamated as expeditiously as possible, and the right of private practice of fully paid services be restricted and controlled.

3. *Future Upper Chambers in State and Central Legislatures*—This Conference notes with satisfaction that the new constitution of the Republic of India provides for Special Representation in the Upper Chambers of the States as also in the Upper House of the Indian Parliament. This Conference recommends to the Government that in each State, adequate Representation be allowed to be sent by the State Branches of the Indian Medical Association.

4. *Drugs Act*—This Conference finds that the Rules made under the Drugs Act 1940 have failed to protect the public from quackery in as much as unregistered and unqualified practitioners can easily prescribe and dispense all poisons and the public can still buy even dengerous poisons without any restriction or without the prescription of a registered medical practitioner. This Conference, therefore, recommends to the Government that the Drugs Rules and, if necessary, the Drugs Act 1940, be amended as early as possible, so as to stop these loopholes.

5. *Blackmarket in Drugs*—This Conference recommends to the U. P. Government that in view of the prevailing blackmarket in drugs particularly in life saving drugs like penicillin, streptomycin, chloromycetin, sulpha group of drugs etc. etc., the U. P. Government should take over the control and sale of such drugs either through their own agency or through Government Controlled agencies under specific conditions.

6. *Indigenous System of Medicine*—This Conference reiterates the following resolution passed at the XIV U.P. Medical Conference:—

This Conference noted with dismay the recommendations of the Government of India Committee on Indigenous Drugs, as also of the U. P. Committee on the same subject. The recommendations are based on mere beliefs and sentiments and do not conform with the modern scientific truth. This Conference is of opinion that money spent on these schemes will serve no useful purpose and cannot be justified. The amount should better be utilised in intregration of science of medicine on scientific lines by encouraging research in modern institutions and thus helping to form an Indian Pharmacopœia.

7. *False Certificates*—This Conference understands that the question of false certification is under active consideration of the Government. This Conference is of opinion that in deciding this matter, no differences should be observed between the certificates issued by Government medical officers and independent medical practitioners. Any certificate which is suspected should be referred to a Board of 3 medical men, at least one of whom should be a representative of the Indian Medical Association.

8. *Exchange of staff and students in Teaching Institutions.*—In the interest of improvement of scientific teaching and promotion of better understanding, this conference recommends to the Government that there should be exchange of fully paid teaching staff of the medical colleges in India and that such a scheme should be considered at an early date.

9. *Duty on Rectified Spirit.*—This Conference is surprised to note that an excise duty of Rs. 102/- per gallon has been levied on one gallon of rectified spirit costing Rs. 1/8/- only. Over and above this the rectified spirit has to be purchased from distant places. This Conference totally disapproves of the present system of supply of rectified spirit to medical practitioners and it recommends to the Government that the supply of rectified spirit to doctors who dispense medicines to their own patients only and for other purely medical purposes under proper control should be modified and they should be allowed to purchase a definite monthly or annual quota at cheaper rate as the present duty is exorbitant and unnecessarily increases the cost of medicines of daily use.

10. *Streptomycin.*—This Conference is not satisfied with the present method of issue of streptomycin, as it leads to serious inconvenience and corruption and recommends that streptomycin should be allowed to be sold on prescriptions of all registered medical practitioners.

11. *Kala azar Units.*—The Conference views with grave concern the disbandment of Kala azar Units, as the disease is spreading rapidly in several districts of the State and recommands that these units be continued.

12. *Anti-Couching.*—This Conference recommends to the Government that necessary legislation be undertaken against Satias and Kohals practising couching and other eye operations.

13. *Nursing.*—In order to encourage more women to take up nursing the following additional steps be taken:—(*a*) Encouragement of training and employment of married women should be given. (*b*) It should not be necessary for them to live in the nurses quarters. (*c*) Creches should be provided for children of nurses, if they bring any. Some nurses will have their duties in these creches. (*d*) So far as possible both husband and wife should be given a job in the same town. (*e*) Family quarters should be provided to married nurses like compounders.

14. *Tuberculosis—Health Visitors.*—This Conference considers that health visiting is very important in treatment of tuberculosis and requests that the Government will meet all expenses of providing Health Visitors in T. B. clinics.

15. *Reserve of Medical Officers.*—That in order to provide a reserve of medical officers for national emergencies this Conference recommends that the Government should formulate a scheme for imparting compulsory military training for 2 years after qualifying and also of maintaining a reserve of all qualified medical men for a certain period.

16. *Liaison between Civil & Military Medical Services.*—This Conference recommends to the Government that steps be taken for providing a machinery for establishing liaison between civil and military medical authorities with a view to utilise their services for the benefit of the public in times of peace.

17. P.S.M.S.—This Conference recommends to the Government that the P.S.M.S. class should not be revived and that all the existing officers in that class be brought to P.M.S. II and that no further recruitment to the P.S.M.S. be made.

NAIHATI BRANCH—The 4th annual general meeting of the branch was held on 11th November, 1950, at which 9 members were present and Dr. D. N. Sen Gupta presided. Dr. D. N. Sen Gupta and Dr. A. K. Paul were elected as President and Secretary of the branch for the year 1950-51.

MALABAR BRANCH—The annual general meeting of the branch was held on 12th November, 1950 with Dr. N. Achuthan in the chair. Dr. Achuthan was elected as President and Dr. C. V. Narayana Iyer and Dr. A. B. Das were elected as Secretaries for the year 1950-51. Dr. U. Krishna Rao, President of the South Indian Provincial Branch, addressed the members and Dr. K. Ramachandran of Madura spoke on "Modern Trends in the Treatment of Peptic Ulcers".

PILIBHIT BRANCH—At the annual meeting of the branch held on 15th November, 1950, 15 members were present and Dr. V. N. Tiwari presided. The members discussed the various methods of election of office-bearers. Dr. A. C. Agorwal and Dr. D. R. Sharma were elected as President and Secretary of the branch for the year 1950-51.

GUNTUR BRANCH—At a general meeting of the branch held on 18th November, 1950, Dr. Sundarajan presided and the members condoled the sad death of Dr. K. S. Ray.

Dr. Janakamohan Rao, then spoke on "low back pain" which was followed by exhibition of a film on 'vitamins' by Messrs. Eli Lilly Co. Ltd.

CHINGLEPUT BRANCH—The annual general meeting of the branch was held on 18th November, 1950 with Dr. C. B. Ethirajuloo in the chair. Dr. Ethirajuloo and Dr. R. Varadarajan were elected as President and Secretary for the year 1950-51. After the routine business, Dr. R. Subramaniam spoke on "Acute Fevers."

RAMNAD BRANCH—The annual meeting of the branch was held at Manamadura on 18th November, 1950 with Dr. H. S. Subramaniam in the chair. Dr. Subramaniam and Dr. S. Sundaresan Kamuti were elected as President and Secretary of the branch for the year 1950-51.

HYDERABAD PROVINCIAL BRANCH—At the last annual meeting of the branch Col. K. N. Waghray and Dr. U. R. Pargaonker were elected as President and Secretary respectively, for the year 1950-51. The secretary informed the members that a plot of land measuring about 8000 sq. yards had been secured from the Government on a rental basis, for the purpose of erecting a building for the Association in Hyderabad. The following members have promised donations for the building:—

Dr. G. K. Kirlosker—Rs. 5,000|-; Dr. B. S. Kirlosker—Rs. 1,000|-; Dr. Shanta Bai—Rs. 1,000|-; Dr. Roop Karan—Rs. 3,000|-; Dr. B. Chandra—Rs. 2,000|-; Dr. P. Ramchander —Rs. 2,000; Dr. Miss A. Shaw—Rs. 1,000|; Dr. Pulla Reddy —Rs. 1,000; Dr. Rangachary—Rs. 3,000|-; Dr. Waghray—Rs. 1,000|-; Dr. Khatri—Rs. 1,000; Dr. Shanker Rao—Rs. 1,000|-; (paid Rs. 500|-); Major M. G. Naidu—Rs. 1,000|- (paid in full); Dr. Miss Shri Khande—Rs. 2,000|- (paid in full); and Dr. P. R. S. Saksena—Rs. 2,000|- (paid Rs. 1,000|-).

CALCUTTA BRANCH—A meeting of the Branch Committee was held on the 14th October, 1950, 20 members were present and Dr. A. K. Sen was in the chair.

The Secretary informed the house that Dr. A. K. Sen and Prof. B. N. Ghosh represented this Association on the Visiting Committee of the Calcutta Medical College Hospital.

Dr. A. D. Mukharji gave a brief account of the main points raised by him and his colleagues while meeting the Director of Health Services, Government of West Bengal, to discuss the various irregularities in medical appointments.

Regarding the possible establishment of the Faculty of Ayurveda by the University of Calcutta, the Committee decided to place the views of the I.M.A. in this matter to the University.

* * * * *

At another meeting of the Branch Committee held on the 20th November, 1950, 17 members were present and Dr. J. C. Banerjee presided.

The Committee regretted that the Government of West Bengal had decided to open a ward for cases of venereal diseases, on the top floor of the Medical College Hospitals. The Committee requested the representatives of this Association on the Visiting Committee to take up this matter.

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Another meeting of the Branch Committee was held on the 4th December 1950 with Dr. A. K. Sen in the chair. 21 members were present.

The Secretary informed the house that a large number of doctors were still in need of telephone installations and the question should be discussed in the presence of Dr. A. K. Sen who represented this Association on the Telephone Advisory Committee of the Government of India for the Calcutta zone. Dr. Sen explained to the house his duties, as an advisor. He also assured the house that priorities were recommended on the principles enunciated by this Association, but he was helpless regarding execution of work in respect of installation of telephones and the grossly inadequate number of new installations available for doctors.

BENGAL PROVINCIAL BRANCH—The first quarterly ordinary meeting of the Branch Council, for the year 1950-51, was held on the 18th December 1950. 28 members were present and Dr. J. C. Banerjee presided.

The Council condoled the sad deaths of Sri Aurobinda Ghosh, Sardar Patel and Dr. K. S. Ray.

The Secretary informed the house that the local branches at Contai, Garhbeta and Kurseong were again revived.

Regarding the 10th Bengal Provincial Medical Conference the Secretary informed the house that the Baruipur-Rajpur branch invited the conference. The Council accepted the invitation and noted, with satisfaction, that the Conference would be held at Baruipur.

UTTAR PRADESH BRANCH—The second meeting of the Branch Council was held on 3rd January, 1951 at Lucknow, with A. C. Banerjee in the chair. 9 members were present. Messages of regret were received from Dr. Bhupal Singh of Meerut and Dr. Jawarlal of Kanpur.

The members condoled the sad deaths of Sardar Patel and Dr. Abul Hussain. The Secretary informed the house that even with 1,300 members contributing Rs. 4/- per member per year to the U.P. State Branch, the State branch is likely to have a deficit of Rs. 366/- at the end of the current year, because of the increased expenditure. He appealed to the members to try to enrol at least 100 new members so that their deficit could be made up.

ASSAM PROVINCIAL BRANCH—An emergent meeting of the Working Committee of the Branch was held at Gauhati on 6th January, 1951 with Dr. H. K. Das in the chair. 7 members were present. Dr. P. C. Duarah, Provincial Secretary gave a brief account of the meetings of the Working Committee and Central Council as well as of the All-India Medical Conference held at Sholapur.

The Committee decided to invite the Working Committee to hold one meeting in Assam during the current calendar year.

SOUTH-INDIAN PROVINCIAL BRANCH—The second meeting of the Branch Council was held at Madras on 7th January 1951, with Dr. U. Krishna Rao in the chair. 21 members attended the meeting. The members condoled the sad death of Sardar Patel.

The President informed the house that as a result of joint representation from the Andhra and S. I. provincial branches, the Hon'ble Minister for prohibition promised to pass orders permitting doctors of Madras Province to possess two pounds of tinctures and spirituous liquors.

The members discussed the question of payment of T.A. to office-bearers and members of the Provincial Council for attending Council meetings and decided to start payment of T.A. to certain office-bearers from the current year. The house also decided that members attending the next meeting of the Council will be entitled to draw T.A. as an experimental measure.

The President placed before the house the correspondence with regard to medical men in services attending medical conferences being considered as on duty. The President also informed the house that negotiations were still going on regarding the Madras Government Order on the government servants for being Secretary or Treasurer of medical associations.

RANIGANJ BRANCH—At a special general meeting of the Branch held on 10th January, 1951, the following condolence resolution was passed, with all members standing:—

"The members of the I.M.A., Raniganj Branch mourn and place on record their deep sense of sorrow at the sad demise of Dr. Jyotish Chandra Ghosh, L.M.S. (CAL. U.), at the age of 78, one of the seiormost members of the medical profession and founder-President of the branch and ex-Vice-President of the Bengal Provincial Branch and pray for peace of the departed soul."

BIHAR PROVINCIAL BRANCH—The second meeting of the Working Committee of the Branch was held at Patna, on 12th January, 1951 with Dr. R. Saran in the chair, 16 members were present.

The house noted with regret, that all members of the Jharia and Purulia branches had resigned. The Secretary was requested to try to hold the next meeting of the Committee at Katihar. The Secretary informed the house that the "Bihar Clinical Establishments Bill 1951" received for opinion from the Government of Bihar was being circulated.

PATNA BRANCH—The 28th annual general meeting of the Patna Medical Association was held at the Patna Medical College, on 14th January, 1951, with Dr. S. K. Ghosh Dastidar in the chair. Dr. Miss. M. P. John and Dr. Damodar Prosad were elected as President and Secretary of the branch for the year 1950-51.

TARAKESWAR BRANCH—At a special general meeting of the Branch held on 20th January, 1951, the members condoled the sad death of Dr. Sushil Kumar Bhattacharya, L.M.S., President of the branch. In this connection the members recalled his gay, humorous and happy mood, his youthful vigour at the age of 65, his excellent services to the patients of the Tarakeswar hospital for over 15 years and his ungrudging services to the profession. He was the President of the branch from May, 1947 till 13th January, 1951 on which date he expired.

The branch was also of considered opinion that the authorities of the Tarakeswar Estate under whom he served at the hospital should grant a liberal gratuity to the family of the deceased doctor.

EAST GODAVARI BRANCH—At a meeting of the branch held on 20th January, 1951 at Pittapuram, with Dr. C. Sitaramaraju in the chair. Dr. N. A. Pantulu spoke on "arsenical encephalitis". Then Dr. Eaton demonstrated an interesting case of "compound fracture".

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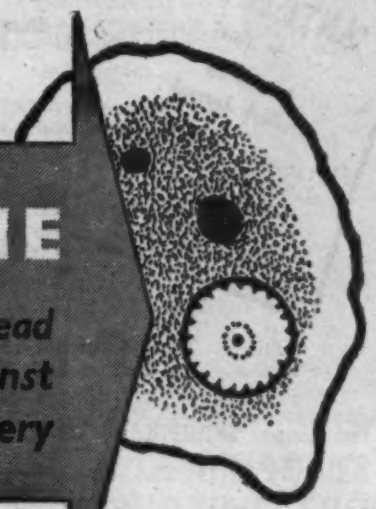

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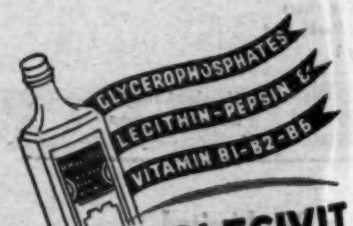

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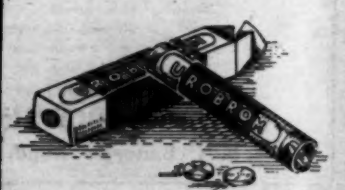

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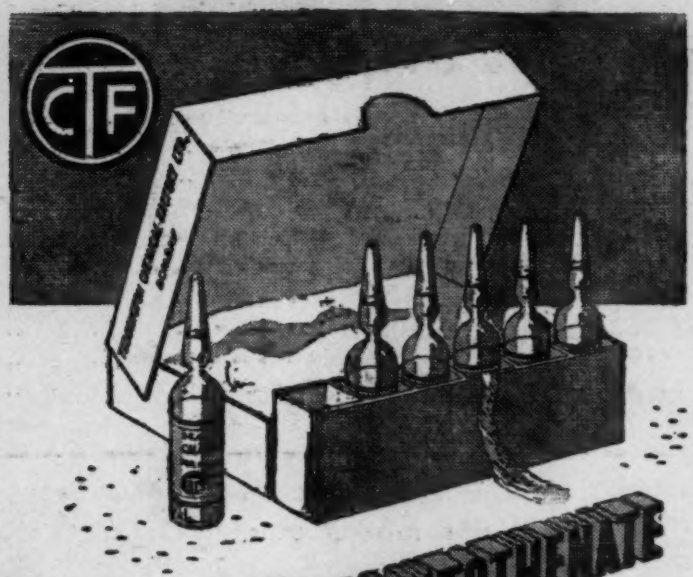

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